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REPORT OF TRANSPORTATION TEST WITH LETTUCE AND CARROTS FROM SALINAS, CALIF., TO CHICAGO, ILL., PHILADELPHIA, PA., BALTIMORE, MD., AND NEW YORK CITY

AUGUST 18 - 30, 1939

By

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Diseases.

Washington, D. C.
March 15, 1940.

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Report of Transportation Test with Lettuce and Carrots From Salinas, Calif., to Chicago, Ill., Philadelphia, Pa., Baltimore, Md., and New York City August 18 - 30, 1939.

By William R. Barger, associate physiologist.

Introduction

This test constitutes part of an investigation of body icing of vegetables that has been conducted by the United States Department of Agriculture since 1925. It was requested by growers and shippers who cooperated with the carriers and the Department. Reports of previous tests are contained in Technical Bulletin No. 627./1

Reports from eastern markets that lettuce and carrots sometimes arrive frozen made the study of ice temperature at point of origin and of load temperature in transit important phases of this test. The present method of icing lettuce and carrot cars consists of blowing crushed ice over the load from the doorway. The blower or "slinger" discharges crushed ice through a flexible hose and throws it with considerable force filling the vertical recesses present between rows of crates and those between the car wall and the load with ice as well as producing a continuous mass over the top. This intimate contact of all crates (especially those in the top layer) with ice

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/1 Body icing in transit refrigeration of vegetables. U. S. Dept. Agr. Tech. Bul. 627, Aug. 1938, is obtainable from the Superintendent of Documents, Washington, D. C., price 10 cents.

makes freezing possible whenever the ice temperature is dangerously low.

In order to determine the temperature of the commodity and the ice, 12 electric resistance thermometers and 2 or 3 recording thermometers were placed in each of 12 cars of lettuce and 3 cars of carrots. The resistance thermometers were read from time to time en route without opening the car doors, while the recording thermometers yielded a continuous temperature record throughout the trip. The recording thermometers were used primarily as a check against the resistance thermometers and since the readings of both types of instruments agree very closely, the temperatures obtained with the recording thermometers will not be discussed in detail.

Purpose

The purpose of the test was to obtain information relative to the rate of cooling and subsequent transit temperature of lettuce and carrots, in cars of three different sizes shipped with initial top ice (crushed), no bunker ice, and no reicing in transit, and to observe the effect of low temperature ice on the commodity. It was also possible to observe the effectiveness of handling practices such as the use of paper separators in crates, the papering of bulkhead openings, and the use of ice under the floor racks.

Inspection at Destination

Inspection at destination was limited to the meltage of ice in transit, to the degree of discoloration of the butts and midribs, and to the amount of bruising, freezing injury, and decay. Inspections were made independently by shippers' representatives who accompanied

the cars, by the Agricultural Marketing Service of the U. S. Department of Agriculture, by the Railroad Perishable Inspection Agency, and by Government investigators who conducted the test.

Tip burn and loose heads were not recorded because they were considered as being primarily of field origin, and not attributable to conditions to which the lettuce was exposed during the test.

Materials and Methods

Cars

Three types of cars, differing in loading space, particularly in length, but not in the insulation provided, were used in the test. They were designated as Standard, Bunkerless, and Giant. Data concerning the age, size, and weight of the cars are given in table 1. Cars of each type were uniform except in weight. The Standard cars were P.F.E. refrigerators with 8'-3" x 33'-2 3/4" available floor area; the Bunkerless cars were similar to the Standard in outside length and inside width but the absence of ice bunkers added about 5-3/4 feet to the length of the loading space; the Giant cars were about 8" wider and about 11'-2" longer than the Standard cars. The ice bunkers of the Giants had collapsible, gate-like bulkheads that could be swung back to the wall making the whole interior of the car available for loading.

Grouping of cars

The fifteen test cars were divided into five groups containing one car of each type. In table 2, the designating test letter, P.F.E. number, type, shipper, and receiver are shown. Group 1 consisting of cars G, B, and C, was destined to Chicago; group 2 consisting of cars D, E, and F, was destined to Philadelphia and Baltimore; groups 3, 4,

Table 1 - Age and dimensions of refrigerator cars used in lettuce and carrot test

August, 1939

Car	P.F.E. No.	Type	Date built	Date reconditioned	Inside width	Inside height	Inside length	Volume	Weight
			mo. yr.	mo. yr.				cu.ft.	lbs.
G	94659	Standard	1923	1939	8'- 3"	7'- 3"	33'-2 3/4"	1988	
R	94667	Standard	7/23	2/39	8'- 3"	7'- 3"	33'-2 3/4"	1988	54,800
D	95054	Standard	8/20	2/39	8'- 3"	7'- 3"	33'-2 3/4"	1988	53,100
M	95529	Standard	5/24	1/39	8'- 3"	7'- 3"	33'-2 3/4"	1988	53,800
A	95655	Standard	1/23	4/39	8'- 3"	7'- 3"	33'-2 3/4"	1988	52,800
S	95737	Bunkerless	10/20	8/39	8'- 3"	7'- 3"	39'-0 "	2333	50,800
N	95738	Bunkerless	8/26	8/39	8'- 3"	7'- 3"	39'-0 "	2333	51,200
H	95739	Bunkerless	5/23	8/39	8'- 3"	7'- 3"	39'-0 "	2333	50,700
B	95740	Bunkerless	1923	8/39	8'- 3"	7'- 3"	39'-0 "	2333	
E	95741	Bunkerless	5/23	8/39	8'- 3"	7'- 3"	39'-0 "	2333	50,400
T	100078	Giant	3/30		8'-11"	7'- 0"	44'-5 "	2679	68,700
F	100167	Giant	3/30		8'-11"	7'- 0"	44'-5 "	2679	66,600
C	100187	Giant	1930		8'-11"	7'- 0"	44'-5 "	2679	
P	100292	Giant	4/30		8'-11"	7'- 0"	44'-5 "	2679	66,300
K	100303	Giant	4/30		8'-11"	7'- 0"	44'-5 "	2679	65,900

Table 2 - List of test cars

Lettuce and Carrot Transportation Test

Salinas to Chicago and New York

August 18 to 30, 1939

Group	Car	P.F.E. No.	Type	No. of crates	Commodity	Shipper	Receiver
1	G	94659	Standard	312	Lettuce	Church	M. Lapidus, Chicago
1	B	95740	Bunkerless	372	Lettuce	Church	M. Lapidus, Chicago
1	C	100187	Giant	428	Lettuce	Church	Lallantia Bros., Chicago
2	D	95054	Standard	312	Lettuce	S V V E	American Stores, Baltimore
2	E	95741	Bunkerless	363	Lettuce	S V V E	American Stores, Philadelphia
2	F	100167	Giant	412	Lettuce	S V V E	American Stores, Philadelphia
3	A	95655	Standard	312	Lettuce	Church	Yeckes-Eichenbaum, New York
3	H	95739	Bunkerless	372	Lettuce	Church	Yeckes-Eichenbaum, New York
3	K	100303	Giant	412	Lettuce	Church	Yeckes-Eichenbaum, New York
4	M	95529	Standard	312	Lettuce	Myers	Wishnatzki & Nathel, New York
4	N	95738	Bunkerless	372	Lettuce	Myers	Wm. Shapiro, New York
4	P	100292	Giant	406	Lettuce	Myers	Carbone Bros., New York
5	R	94667	Standard	346	Carrots	Harden	Yeckes-Eichenbaum, New York
5	S	95737	Bunkerless	412	Carrots	Harden	Yeckes-Eichenbaum, New York
5	T	100078	Giant	453	Carrots	Harden	Yeckes-Eichenbaum, New York

and 5, consisting of cars A, H, and K, M, N, and P, and R, S, and T, respectively, were unloaded at New York City. Each shipper loaded one or two whole groups so that the grading and handling methods used were comparable within each group. The lettuce in the group consisting of cars M, N, and P was packed under two brands but was all of the same grade.

Crates

Los Angeles type crates were used. Inside dimensions of the lettuce crates were 13-3/4" by 17-1/2" by 21-5/8" and of the carrot crates 13" by 18" by 21-5/8". Both kinds of crates were 24-1/2" long outside. The methods of packing used resulted in a 2-1/2" to 3" bulge of the top after lidding.

Packing

All crates were lined with either waxed or parchment paper and contained three layers of heads of lettuce (butts up) or of bunches of carrots with a few pounds of crushed ice between each layer. Fifteen to twenty pounds of crushed ice (bulge ice) were used under the lid. No ice was used under the bottom layer in the crate. Lettuce in cars M, N, and P was packed with a sheet of waxed paper between the butts and the ice of each layer; in cars D, E, and F no paper was used. In the other six cars of lettuce, paper was used between the top layer and the bulge ice only. No paper separators were used in the carrot crates.

Loading

Lettuce: The crates in the lettuce cars were loaded four layers high with those in the three lower layers lying on their sides. Crates along the side walls of the car had their bottoms facing the wall. Crates of the top layer were loaded upright in cars M, N, and P, and

were turned on their sides (bottoms wallward) in all other cars. The loads were five rows wide and spaced to admit ice in the recesses between the rows and between the outer row and the wall. Considerably wider spaces for recess ice occurred in the Giant cars because of the extra width of these cars.

Carrots: The carrot loads were also four crates high on their sides with the bottoms of the outer crates turned to the wall. The two lower layers of crates and part of the third were six rows wide. Layers six crates in width formed a solid load in the Standard and Bunkerless cars, leaving no space for recess ice along the wall or between the rows except the small vertical channels formed by the low ends of the crates. The Giant car, being wider, had more space for recess ice. The top layer and part of the third layer of all cars were five rows wide and here there was room for recess ice.

Through loads (solid across the doorway) were used for both lettuce and carrots although wooden strips were needed in some cars to take up the slack between stacks. The Standard cars contained 16 stacks from end to end (312 crates of lettuce or 346 crates of carrots), the Bunkerless cars 19 stacks (372 crates of lettuce or 412 crates of carrots), and the Giant cars 21 stacks (406 to 428 crates of lettuce or 453 crates of carrots).

Preparation of cars

In cars of group 3 (lettuce to New York) and cars of group 5 (carrots to New York) 1800 to 2700 pounds of crushed ice was placed under the floor racks. This was not done in the other cars.

The bunker openings in the bulkheads of car R (Standard) were covered with heavy paper whereas those of the other Standard cars were not.

In all cars, both doorways were covered over with heavy paper on the inside.

Icing of cars

No bunker ice was used, all ice being confined to the body of the cars. The test cars were purposely filled with top ice to practically full capacity in order to furnish all the refrigeration possible and to enable a comparison to be made of the performance of the three types of cars under these conditions. Sixty to 108 blocks of ice (18,000 to 32,400 pounds) were needed to fill the lettuce cars, but the carrot loads, having practically no space between the rows for recess ice, took 51 blocks to fill the Standard car and 81 blocks to fill the Giant car. Three or 4 solid blocks of ice were used in each doorway to make a retaining wall for the crushed ice.

The icing of the cars in this test was intended to set up special experimental conditions and not necessarily to represent commercial practice. The quantity of ice furnished per car, not being considered an essential part of the test, was not accurately determined and for that reason no detailed icing records are given.

At times, the ice in 300-pound blocks comes directly from 8-12° freezing tanks or from 25-28° storage rooms and has little chance under normal handling to warm up to 32° before it is used. The rate of warming is probably not much faster than the rate of cooling after freezing. The ice is run through mechanical crushers at the rate of about 5 blocks per minute and conveyed to the packers and to the car blower through a screw-type conveyor. Although it may travel more than 300 feet before it is used it warms up only one or two degrees in the conveyor. As a rule, the crushed ice stands in a bin and warms

somewhat before the packers use it in the crates but when cars are to be top-iced the ice goes directly from the crusher to the car. Recent tests have indicated that the blowing operation warms the ice very little after it is crushed and conveyed to the blower.

In some packinghouses a secondary ice crusher is used to pulverize the crushed ice for use in crates. These machines have an additional heating effect on the ice and also by reducing the ice to fine particles, promote rapid warming after the ice leaves the machine. However, in this test none of these pulverizers was used for top icing.

The temperature of the ice before and after crushing as used in the crates and over the load is given in table 3. The temperature of several blocks of ice for each car was obtained by placing a mercury thermometer in a small hole drilled in the ice. The temperature of the crushed ice is that obtained by catching ice at the bins or at the blower in wooden pails and inserting a thermometer into the center of the mass. Under the conditions that prevailed it was impossible to determine the rise in temperature of any particular block during the crushing operation. Therefore, the ice in pail No. 1 did not necessarily come from block No. 1.

The group consisting of cars M, N, and P was intended to determine the effect of low temperature ice on lettuce. Arrangements were made for the delivery of low temperature ice a part of which was used immediately to supply package ice and top ice for car M; the rest, after standing about 1-1/2 hours, was used for car N. Ice for car P was taken from the regular supply used at this packinghouse. It was

Table 3. Temperatures of solid blocks of ice and crushed ice used in various cars.

Cars [1] and Destination	Block or Pail [2]	Standard				Bunkerless				Giant			
		For Crates		For top Icing		For Crates		For top Icing		For Crates		For top Icing	
		Block	Pail	Block	Pail	Block	Pail	Block	Pail	Block	Pail	Block	Pail
G, B, C Chicago	1	28.0	30.0	27.0	28.5	29.0	30.0	22.5	30.0	31.0	30.0	29.0	30.0
	2	23.0	30.0	26.0	29.0	28.5	31.0	29.0	31.0	30.0	29.0	29.0	30.0
	3	24.0	28.0	29.0	28.5	20.5	29.0	25.0	29.0	22.5	30.0	26.0	27.0
	4	22.0	28.5	26.0	28.5	31.5	30.0	29.0	31.0	25.0	29.0	26.0	27.0
	5	28.0	27.0	26.0	26.0	28.0	30.0	29.0	30.0	29.0	30.0	26.0	28.0
	6	27.5	29.0	22.0	27.0	29.0	29.0	29.0	30.0	28.0	28.5	26.0	27.5
	Ave.	25.4	28.8	26.0	27.9	27.7	29.8	27.2	30.2	27.6	29.4	27.0	28.3
D, E, F Philadelphia Baltimore	1	20.0	27.0	27.5	29.0	26.5	32.0	25.5	29.0	32.0	31.0	32.0	31.0
	2	23.5	29.0	32.0	31.0	25.5	31.0	29.5	28.0	30.0	30.0	30.0	30.0
	3	28.0	31.0	30.0	30.0	28.0	30.0	23.0	31.0	24.5	30.0	32.0	31.0
	4	27.5	29.0	32.0	32.0	25.5	29.0	20.0	27.0	30.0	31.0	30.0	31.0
	5				30.0					32.0	30.0	31.0	31.0
	Ave.	24.8	29.0	30.4	30.4	26.4	30.5	24.5	28.8	29.7	30.4	31.0	30.8
A, H, K New York	1	24.0	27.0	28.0	30.0	31.5	31.0	22.0	27.5	26.0	27.0	26.0	30.0
	2	31.0	31.0	29.0	30.5	28.5	31.5	26.0	30.0	25.0	31.0	26.0	29.0
	3	32.0	31.0	28.0	31.0	31.5	31.5	26.0	29.0	26.0	31.0	24.0	31.0
	4	26.0	32.0	26.0	30.0	24.0	28.5	22.0	27.5	27.0	28.0	25.0	29.0
	5	24.0	28.0	28.0	30.0	24.0	30.0	32.0	28.5	26.0	27.0	26.0	29.0
	6	24.0	28.0	28.0	30.0	22.0	31.0	31.0	27.0	24.0	29.0	27.0	28.5
	Ave.	26.8	29.5	27.8	30.2	26.9	30.6	26.5	28.2	25.7	28.8	25.7	29.4
M, N, P New York	1	20.5	33.0	24.0		24.0	32.0	24.0		22.0	31.0	26.0	
	2	20.0	32.0	25.0		25.0	32.5	25.0		24.0	32.0	26.0	
	3	26.0	32.5	24.0		24.0	33.0	25.0		25.0	31.0	27.0	
	4	24.0	32.0	24.0		24.0	33.0	26.0		26.0	32.0	27.0	
	5	24.0				24.0	31.0			33.0	32.0	27.0	
	6	25.0				22.0	32.0			34.0	32.0	28.0	
	Ave.	23.2	32.4	24.2		23.8	32.2	25.0		27.3	31.7	26.8	
R, S, T New York	1	32.0	31.5		31.5					30.5	31.5		31.0
	2	32.0	31.5		31.5					31.0	31.0		30.5
	3	32.0	29.5		31.0					26.5	31.5		30.5
	4	32.0	31.5		31.5					25.0	31.0		28.5
	5	19.5	31.5							30.5	31.2		
	6	19.5	31.2							29.5	30.5		
	Ave.	27.8	31.1		31.4	26.3	31.7		31.8	28.8	31.1		30.2

[1] Listed in the following order: Standard, Bunkerless, Giant.
[2] The samples of crushed ice were collected in pails.

slightly different from the ice used in cars M and N and also from that used in the houses in that it was "pulled" from the freezing tanks while there still remained a large unfrozen core in the block. This indicates that the blocks were produced in a minimum of time in the freezing tanks. A short freezing time should result in a high average temperature and and added exposed surface made by the large core should cause the block to warm up faster than others that are more solidly frozen.

Placement of Thermometers

Resistance thermometers were used to take temperatures of the commodity and ice in transit without opening the car doors. In most cars temperatures were taken of the top and bottom of the load near the centerline in stack 1 at the bunker/2; in stack 4 or 5 at the quarterlength, and in stack 8 or 9 at the doorway. In cars M, N, and P used for special freezing studies, temperatures of the top of the load only were taken. In carrot cars temperatures of the top, middle and bottom of the load were taken along the wall together with those of the top and bottom along the centerline. All thermometers were in the forward end of the cars en route. Commodity temperatures were obtained by inserting the thermometers in heads of lettuce or between the roots of a bunch of carrots. Top ice temperatures were taken in the ice mass at points about 2" above top crates. The thermometers used in the top ice were held in place by thrusting them upward through an upper slat of a crate.

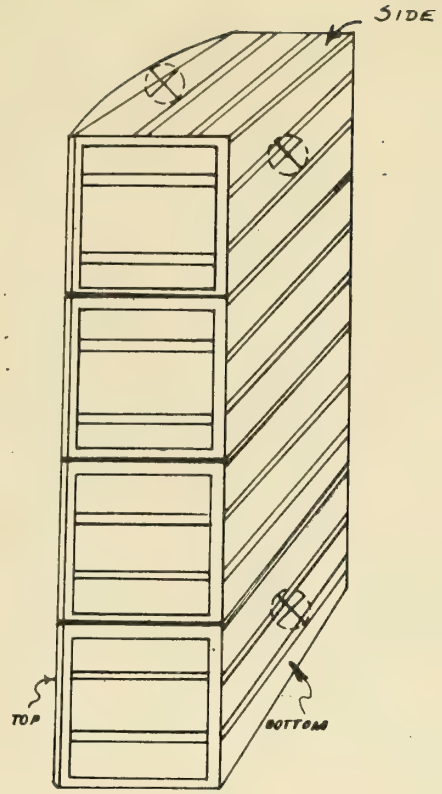
/2 In this report the first stack of crates at the end of a car is designated as the bunker stack regardless of the type of car.

The position of thermometers for taking commodity temperatures in the stacks along the centerline of all cars except M, N, and P is shown in figure 1-A. Thermometers were placed in the center head or bunch in the bottom layer of both the top and bottom crates and along the edge of the top layer of the top crate. This means that because of the side-wise loading of these crates, one of the thermometers in each stack was near the top and one was near the bottom of a recess channel and another was adjacent to the top ice (fig. 1A). The carrot temperatures taken along the centerline of the cars were also at the points shown in figure 1A.

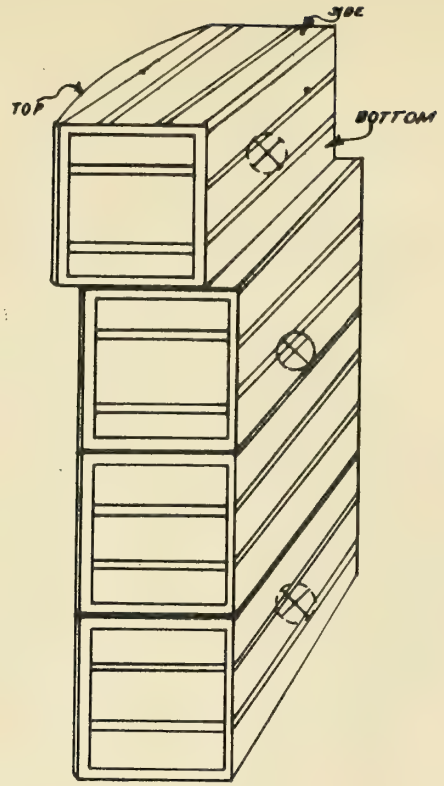
The position of thermometers for taking commodity temperatures along the side wall of carrot cars is shown in figure 1-B. Temperatures were taken of the center of the bottom layer of the top and bottom crates, the same as was done along the centerline. The temperature of the middle layer of the load was taken at the lower bottom edge of the third layer crate.

In cars M, N, and P used for special freezing studies, the top crates were loaded upright and the thermometers were placed at the top bunker and top quarterlength positions as follows: in the center head of the top layer in the crate (similar to point #1, fig. 1-C), in the bulge ice next to this head (similar to point #2, fig. 1-C), in the top ice 2" above the crate; and at the top doorway position as follows: in the above three places and in addition in the center heads of the second (middle) and third (bottom) layers in the crate and in the package ice between the top and middle layers of heads. The position of the thermometers in the top doorway crate in these three cars is shown in figure 1-C.

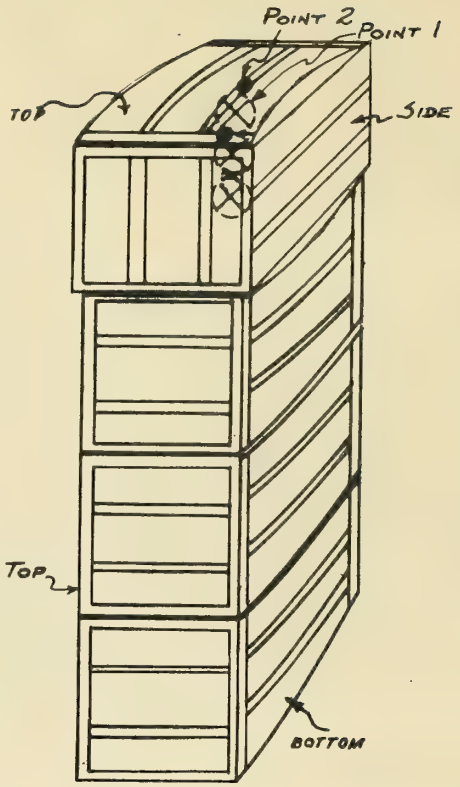
Fig. 1



A
All Crates
On Side.



B
All Crates
On Side.
(Top Crate Can Be Set
In From The Car Wall Because
Top Layer Is 5 Crates Wide)



C
Top Crate
Upright.

⊗ Commodity Temp.

• Air Temp.

Location Of Thermometers In Crates

A: In Stacks Along Center Line Of Lettuce And Carrot Cars.

B: In Stacks Along Sidewall Of Carrot Cars.

C: In Top Doorway Crates In Lettuce Cars M, N And P. In The Bunker And Quarterlength Stacks Temperatures Were Taken At Points 1 & 2 Only.

Location of test crates

For convenience of reference, certain crates in the bunker, quarterlength, and doorway stacks were marked in order to make the results of inspection of all cars as comparable as possible. The designation and location of the various test crates are shown in table 4. In many instances these crates contained resistance thermometers and recording thermometers. Whenever recording thermometers were used they were placed in the end of the crate nearest to the forward end of the car.

Schedule of Trip and Outside Temperature

The running time of the train from Salinas, California, to Harismus Cove, New Jersey, transfer yards for New York City, is shown in table 5. The route followed was over the S. P., Salinas to Ogden; U. P., Ogden to Omaha-Council Bluffs; C. and N. W., Council Bluffs to Proviso; I. H. B., Proviso to Dolton; Penn., Dolton to Philadelphia, Baltimore, and New York City. Following arrival at Proviso, Illinois at 6:45 P.M., Thursday, August 24, the Chicago cars were unloaded at the C. and N. W. team track, 15th and Morgan Streets at 4:30 A.M., August 25. The Philadelphia and Baltimore cars were transferred at Enola, Pennsylvania at about 6:00 P.M., Saturday, August 26, arriving at Philadelphia early Sunday morning. Arrival at Harismus Cove, New Jersey (New York transfer) was at 1:00 A.M., Sunday, August 27, and the cars were on the Pennsylvania railroad team track at 37th Street and 12th Avenue, New York City ready for unloading at 7:00 P.M., August 27.

The outside temperatures encountered are shown in table 6. Maximum temperatures between 96° F. and 101° F. occurred during the first three days en route, Watsonville to Ogden, followed by 84° at

Table 4

Location of Test Crates and

Recording Thermometers

Centerline				South wall (en route)			
Crate 1	Bottom	crate	Bunker stack	Crate 1X	Bottom crate		Bunker stack
				Crate 1Y	3rd layer	crate	Bunker stack
Crate 2	Top	crate	Bunker stack /1	Crate 2X	Top	crate	Bunker stack/1
Crate 3	Bottom	crate	Quarterlength stack.	Crate 3X	Bottom	crate	Quarterlength stack
				Crate 3Y	3rd layer	crate	Quarterlength stack
Crate 4	Top	crate	Quarterlength stack/1	Crate 4X	Top crate		Quarterlength stack
Crate 5	Bottom	crate	Doorway stack	Crate 5X	Bottom	crate	Doorway stack
				Crate 5Y	3rd layer	crate	Doorway stack
Crate 6	Top	crate	Doorway stack	Crate 6X	Top crate		Doorway stack

/1 Location of recording thermometers.

Table 5

SCHEDULE OF TEST TRAIN

Origin Salinas, California
Destination New York, N. Y. Commodity Lettuce
Routing S.P., U.P., C & NW, I.H.B., Penn.

Test No. Calif. 1939-3. --P.F.E. 197

Arrived		Place	Departed	
Date	Time		Date	Time
8/18/39		Salinas, California	8/19/39	12:45AM PT
8/19/39	1:30AMPT	Watsonville Jct., California	8/19/39	3:15AM
8/19/39	5:30AM	San Jose, California	8/19/39	6:40AM
8/19/39	3:30PM	Roseville, California	8/19/39	5:45PM
8/20/39	3:15AM	Sparks, Nevada	8/20/39	5:00AM
8/20/39	10:20AM	Imlay, Nevada	8/20/39	11.45AM
8/20/39	2:15PM	Red House, Nevada	8/20/39	2:41PM
8/20/39	7:00PM	Carlin, Nevada	8/20/39	9:00PM
8/21/39	5:00AM	Montello, Nevada	8/21/39	5:35AM
8/21/39	12:00N PT	Ogden, Utah	8/21/39	3:40PM MT
8/21/39	7:00PMMT	Evanston, Wyoming	8/21/39	7:25PM
8/21/39	10:45PM	Green River, Wyoming	8/22/39	12:15AM
8/22/39	10:15AM	Laramie, Wyoming	8/22/39	12:25PM
8/22/39	4.00PM	Cheyenne, Wyoming	8/22/39	5:15PM
8/23/39	12:30AMMT	North Platte, Nebraska	8/23/39	4:15AM CT
8/23/39	8:30AMCT	Grand Island, Nebraska	8/23/39	10:30AM
8/23/39	3:40PM	Council Bluffs, Iowa	8/23/39	10:40PM
8/24/39	3:15AM	Boone, Iowa	8/24/39	4:20AM
8/24/39	10:30AM	Clinton, Iowa	8/24/39	12:30PM
8/24/39	6:45PM	Proviso, Ill. (Chicago transfer)	8/24/39	10:40PM
8/25/39	2:15AM	Blue Island, Illinois	8/25/39	6:55AM
8/25/39	7:15AM	Dolton, Illinois	8/25/39	9:28AM
8/25/39	11:45AM	Logansport, Indiana	8/25/39	12:15PM
8/25/39	6:45PMCT	Columbus, Ohio	8/25/39	8:45PM ET
8/26/39	3:10AMET	Pitcairn, Pennsylvania (Pittsburgh)	8/26/39	5:00AM
8/26/39	9:00AM	Altoona, Pennsylvania	8/26/39	10:00AM
8/26/39	11:00AM	Huntington, Pennsylvania	8/26/39	11:40AM
8/26/39	1:25PM	Enola, Pennsylvania (Harrisburg)	8/26/39	6:40PM
8/27/39	1:00AM	Harismus Cove, N.J. (N.Y. transfer)		
8/27/39	7:00PM	Penn. R. R. Team Track 37th St. & 12th Ave., New York		

Table 6. Record of Outside Temperatures

Salinas, Calif., to New York City
Test No. Calif. 1939-3. PFE 197

Route SP, UP, C&NW, IHB, Penn.
August 1939.

Day	Date 1939	Time	Temperature °F.
Friday	8/18	8:00AM	60
	"	9:00AM	63
	"	10:00AM	62
	"	11:30AM	73
	"	12:00M	66
	"	4:00PM	60
	"	5:00PM	60
	"	9:00PM	58
Saturday	8/19	2:00AM	55
	"	3:00AM	55
	"	6:00AM	58
	"	8:00AM	66
	"	9:30AM	75
	"	10:30AM	82
	"	1:30PM	92
	"	3:00PM	98
	"	3:30PM	101
	"	5:30PM	90
	"	7:00PM	90
	"	8:00PM	80
	"	9:15PM	72
Sunday	8/20	3:00AM	64
	"	5:00AM	63
	"	9:30AM	87
	"	10:00AM	89
	"	11:45AM	90
	"	12:30PM	97
	"	1:00PM	96
	"	2:00PM	101
	"	3:15PM	89
	"	4:00PM	84
	"	4:30PM	74
	"	6:00PM	67
	"	7:00PM	72
	"	9:00PM	70
	"	9:40PM	62
Monday	8/21	5:00AM	54
	"	8:00AM	77
	"	9:00AM	84
	"	10:00AM	83
	"	12:00M	97
	"	3:00PM	94
	"	3:30PM	98
	"	5:00PM	94
	"	7:00PM	77
	"	7:30PM	63
	"	10:30PM	64
	"	3:00AM	42
Tuesday	8/22	5:00AM	66
	"	8:30AM	67
	"	10:00AM	64
	"	12:00M	74

Day	Date 1939	Time	Temperature °F.
Tuesday	8/22	2:30PM	75
	"	3:15PM	84
	"	4:00PM	82
	"	5:15PM	82
	"	7:50PM	68
	"	9:00PM	68
	"	10:00PM	58
Wednesday	8/23	12:30AM	52
	"	3:00AM	50
	"	7:00AM	54
	"	9:15AM	71
	"	10:30AM	81
	"	12:30PM	91
	"	2:20PM	91
	"	3:00PM	92
	"	4:00PM	98
	"	5:00PM	89
	"	7:00PM	87
	"	8:00PM	82
	"	10:00PM	78
	"	10:40PM	78
	"	12:00PM	54
Thursday	8/24	3:15AM	52
	"	8:00AM	64
	"	10:00AM	78
	"	12:00M	82
	"	1:45PM	86
	"	3:00PM	86
	"	4:00PM	86
	"	6:00PM	76
	"	7:00PM	77
	"	10:30PM	72
	"	12:00PM	72
Friday	8/25	2:15AM	64
	"	7:00AM	66
	"	10:00AM	74
	"	11:45AM	82
	"	2:00PM	84
	"	5:00PM	78
	"	7:00PM	75
	"	10:00PM	66
	"	11:00PM	60
	"	2:00AM	52
Saturday	8/26	4:00AM	52
	"	7:00AM	60
	"	9:00AM	68
	"	10:00AM	79
	"	1:20PM	81
	"	4:00PM	94
	"	6:00PM	82
	"	6:30PM	79
	"	9:00PM	69
	"	10:30PM	67
Sunday	8/27	1:00AM	68
	"	2:30AM	68
	"	7:20PM	76

Cheyenne on the 4th day, and 98° at Council Bluffs on the 5th day. Maxima of 84° to 94° occurred during the remainder of the trip. Minimum temperatures were generally between 50° and 60° with the exception that on the 4th morning, west of Laramie, the temperature dropped close to 40° and on the night of the transfer at Chicago the temperature was between 65° and 70°.

Results and Discussion

Load Temperatures in Transit

In the group of tables of appendix 1 are recorded in detail all the temperatures obtained en route with the resistance thermometers and also the position in the car of each thermometer. The average temperatures of the top and bottom of the load along the centerline as compared with the top-ice temperature at the bunker and quarterlength positions and the temperature of the commodity adjacent to the top ice at these positions are shown in figures 2 to 13. The average temperature of the top and bottom of the load is the average of the three bottom heads of lettuce, or bunches of carrots, in the bottom and top layers of crates. The temperature of the commodity adjacent to the top ice is that of the top layer next to the top ice at the bunker and at the quarterlength.

Figures 14 to 16 contain graphs of the temperature of lettuce adjacent to the bulge ice in upright crates, and of bulge ice and top ice at the bunker and quarterlength positions in cars M, N, and P.

Temperatures obtained with thermometers placed in the top ice are undoubtedly air temperatures when the readings are above 32°. When such temperatures were obtained early in the transit period it probably was because the thermometer had come out of contact with the top ice but

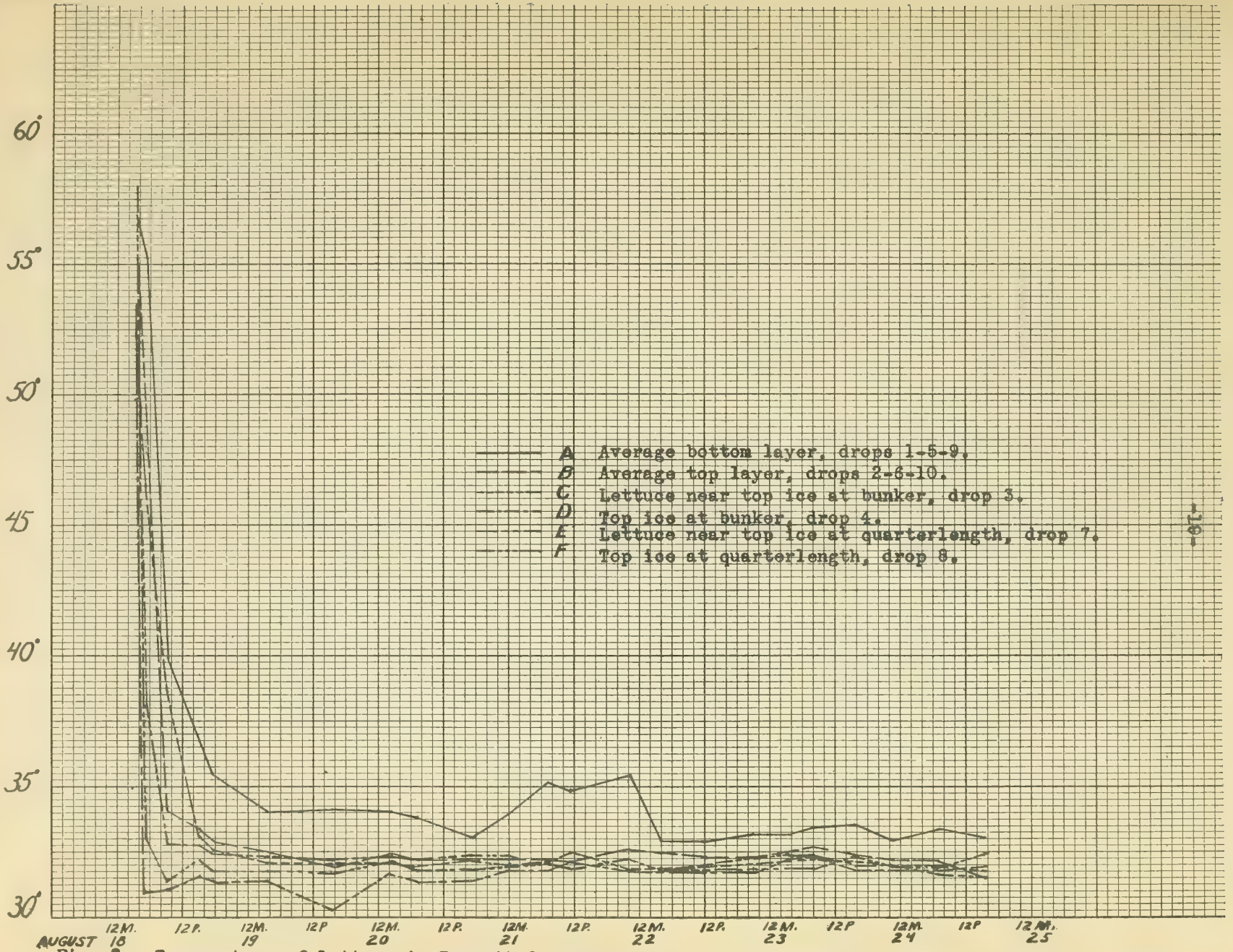


Fig. 2 - Temperature of Lettuce in Transit from Salinas, Calif., to Chicago, Ill., Aug. 18 to 25, 1939
Car G - Standard Type (See footnote 1, table for G in appendix).

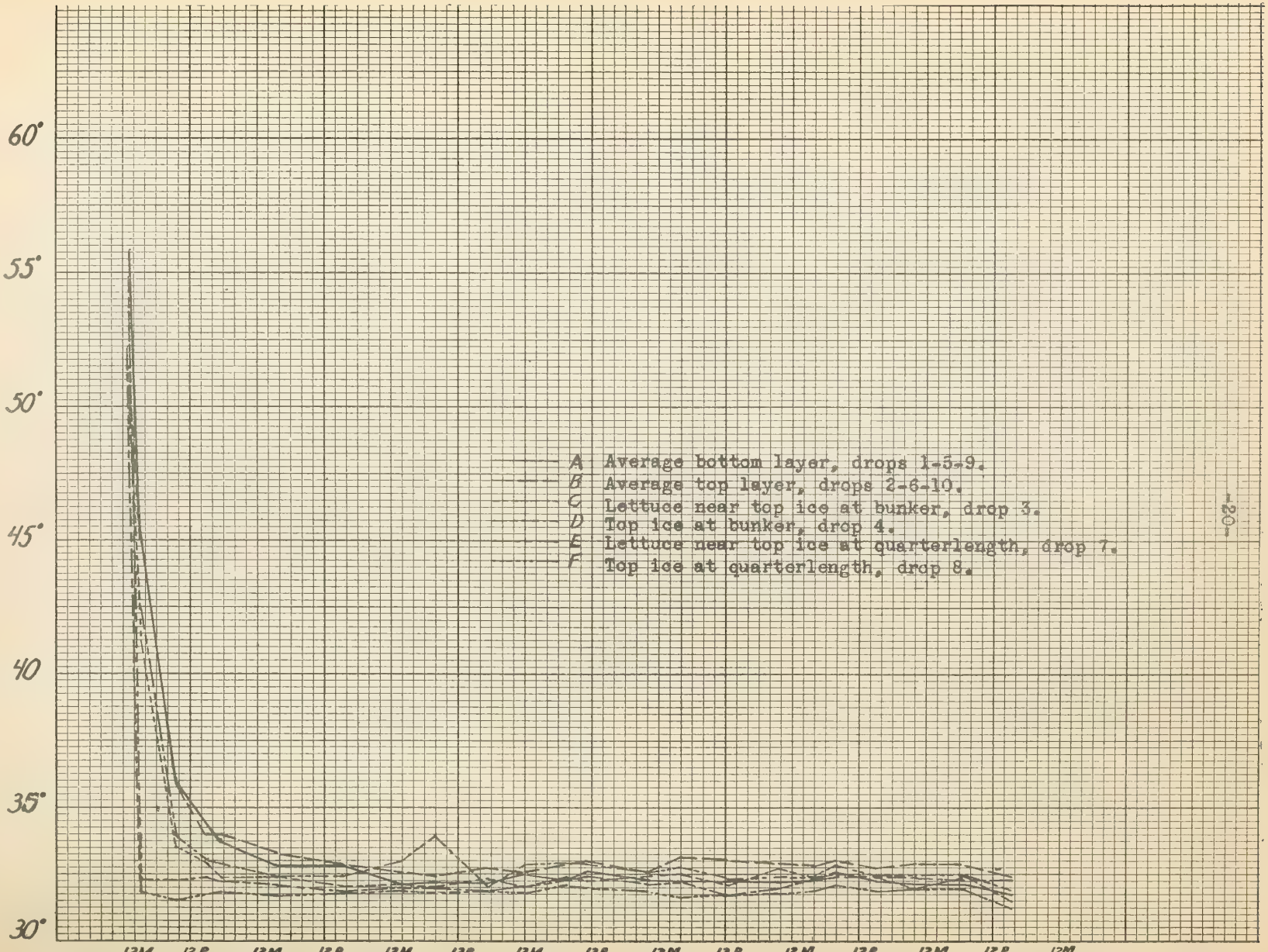


Fig. 3 - Temperature of Lettuce in Transit from Salinas, Calif., to Chicago, Ill., Aug. 18 to 25, 1939
Car B - Bunkerless Type

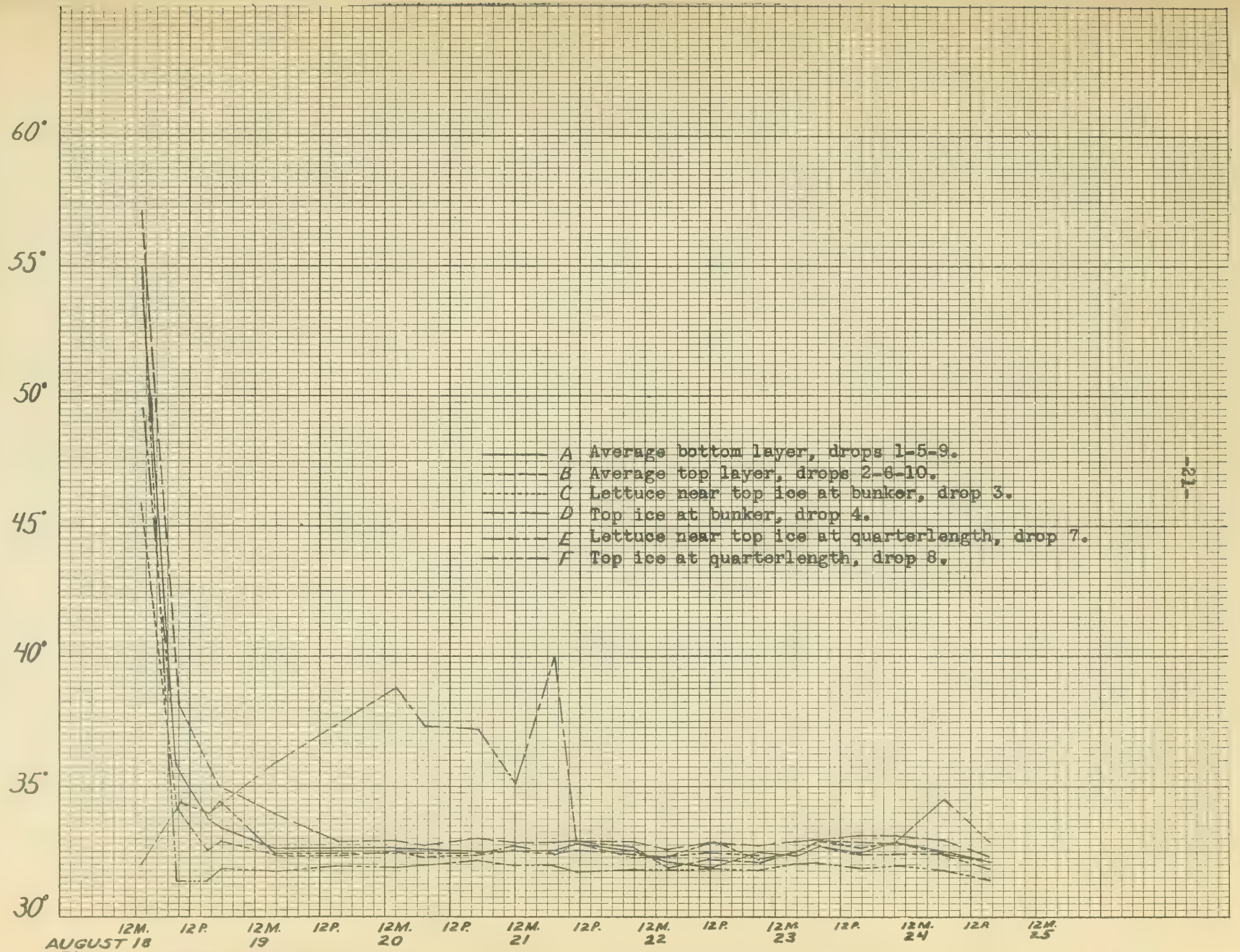


Fig. 4 - Temperature of Lettuce in Transit from Salinas, Calif., to Chicago, Ill., Aug. 18 to 24, 1939
Car C - Giant Type (See footnote 1, table for C in appendix)

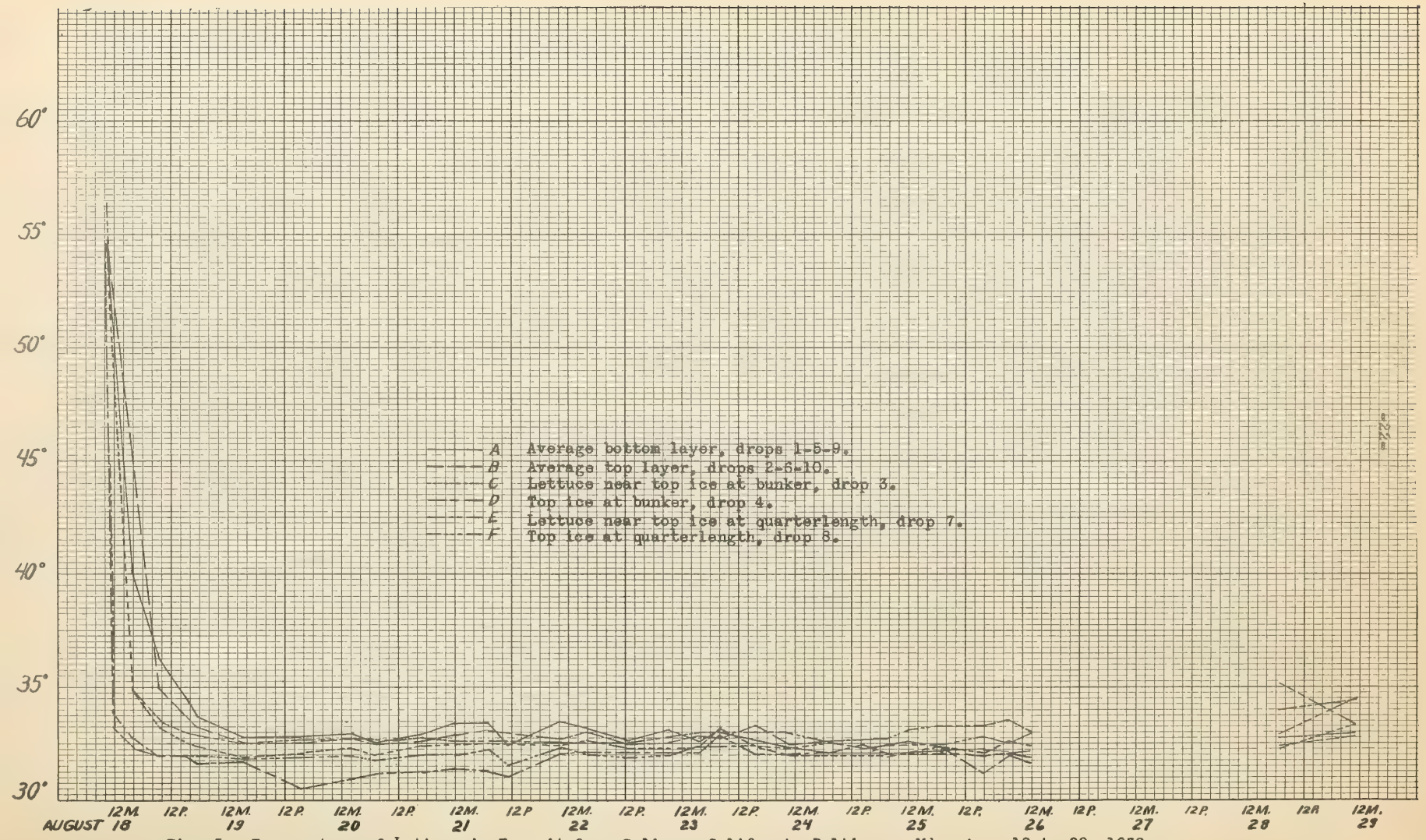

60°
55°
50°
45°
40°
35°
30°
A Average bottom layer, drops 1-5-9.
B Average top layer, drops 2-6-10.
C Lettuce near top ice at bunker, drop 3.
D Top ice at bunker, drop 4.
E Lettuce near top ice at quarterlength, drop 7.
F Top ice at quarterlength, drop 8.
AUGUST 18 12M. 12P. 19 20 21 22 23 24 25 26 27 28 29

Fig. 5 - Temperature of Lettuce in Transit from Salinas, Calif., to Baltimore, Md., Aug. 18 to 29, 1939
Car D - Standard Type

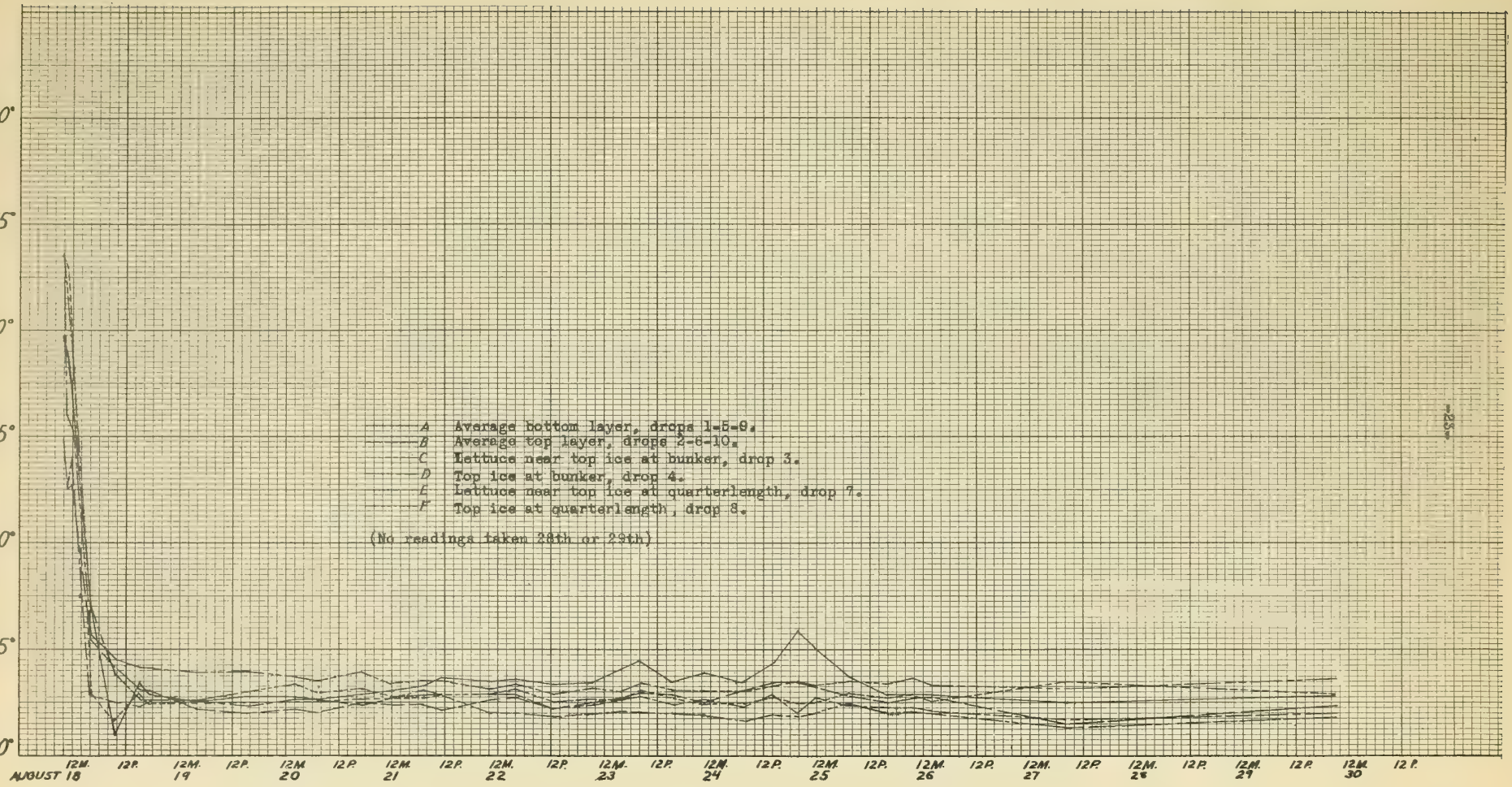


Fig. 6 - Temperature of Lettuce in Transit from Salinas, Calif., to Philadelphia, Pa., Aug. 18 to 30, 1939
Car E - Bunkerless Type

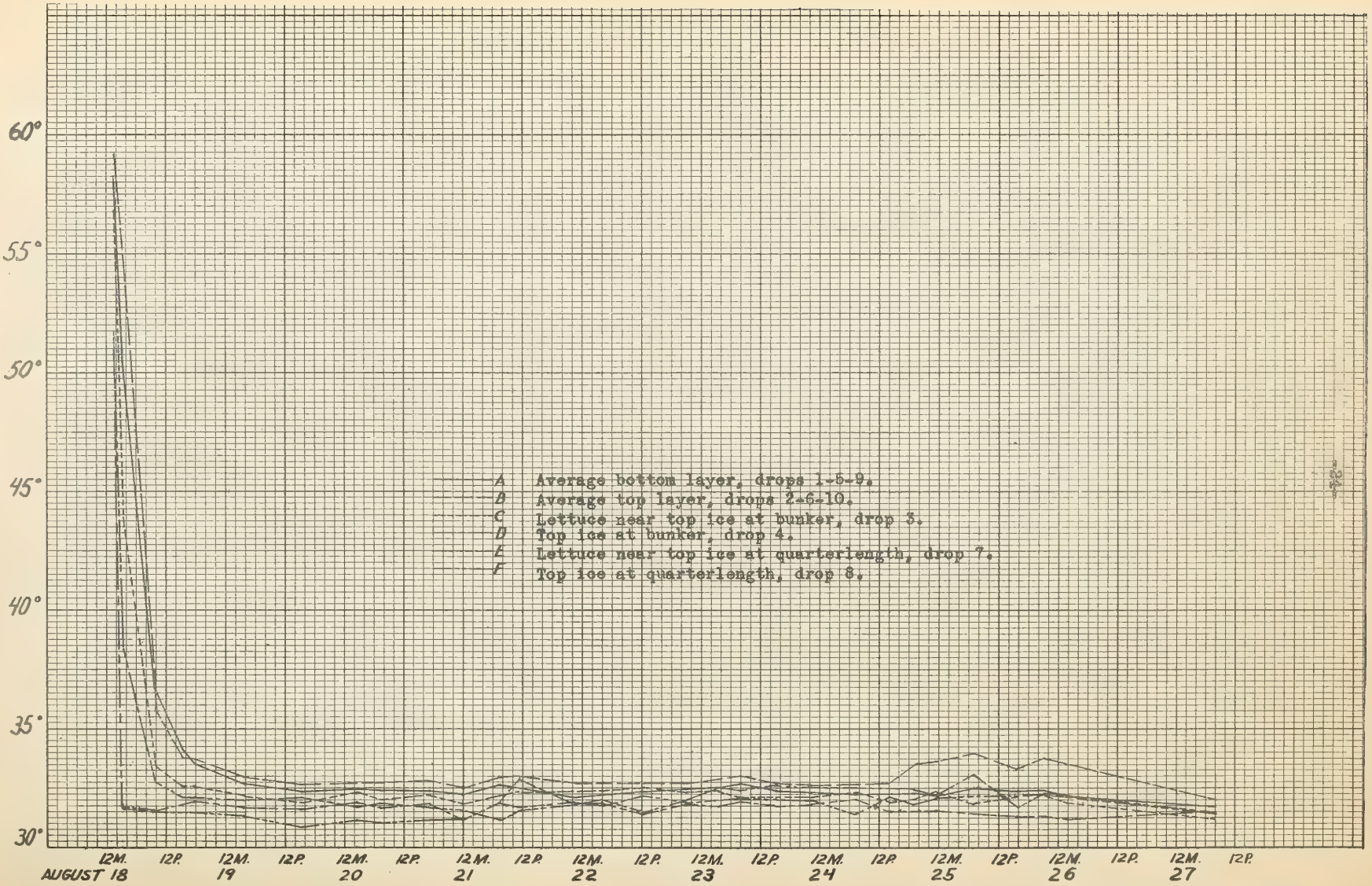

60°
55°
50°
45°
40°
35°
30°
A Average bottom layer, drops 1-5-9.
B Average top layer, drops 2-6-10.
C Lettuce near top ice at bunker, drop 3.
D Top ice at bunker, drop 4.
E Lettuce near top ice at quarterlength, drop 7.
F Top ice at quarterlength, drop 8.
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27

Fig. 7 - Temperature of Lettuce in Transit from Salinas, Calif., to Philadelphia, Pa., Aug. 18 to 27, 1939
Car F - Giant Type

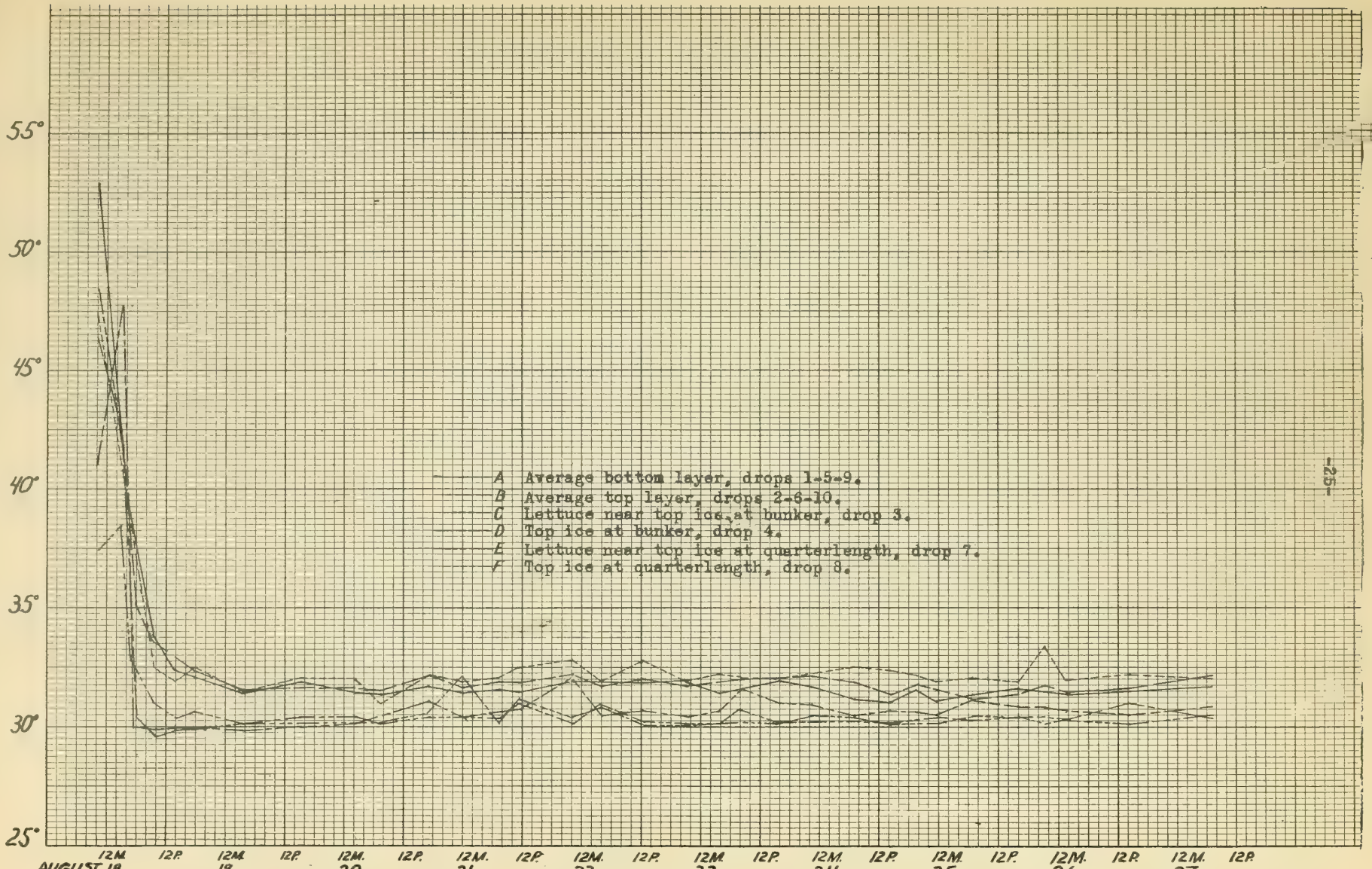

55°
50°
45°
40°
35°
30°
25°
A Average bottom layer, drops 1-5-9.
B Average top layer, drops 2-6-10.
C Lettuce near top ice at bunker, drop 3.
D Top ice at bunker, drop 4.
E Lettuce near top ice at quarterlength, drop 7.
F Top ice at quarterlength, drop 8.
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27

Fig. 8 - Temperature of Lettuce in Transit from Salinas, Calif., to New York City, August 18 to 27, 1939.
Car A - Standard Type (Ice Under Floorrack)

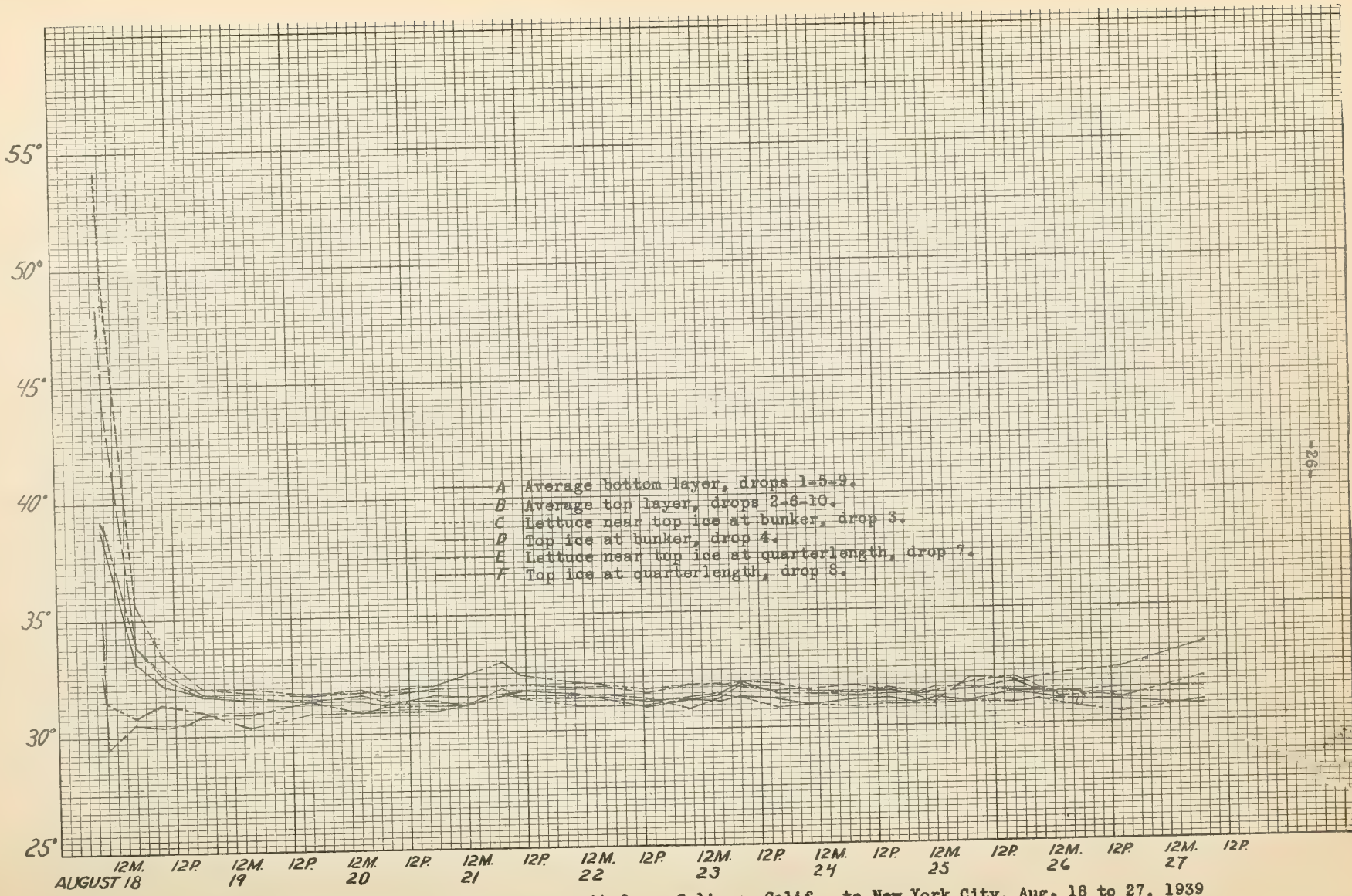


Fig. 9 - Temperature of Lettuce in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939
Car H - Bunkerless Type (Ice Under Floorrack)

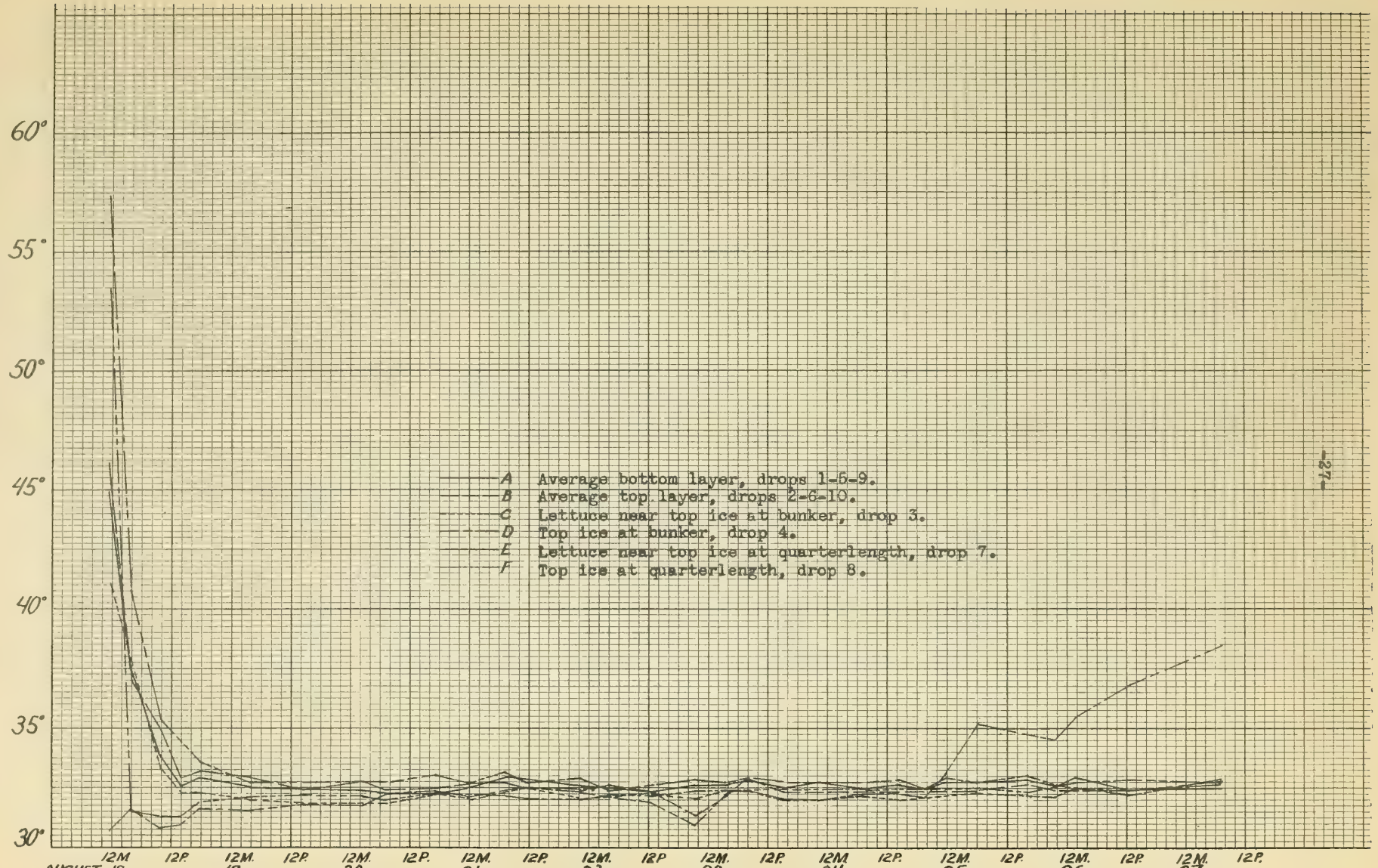


Fig. 10 - Temperature of Lettuce in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939
Car K - Giant Type (Ice Under Floorrack)

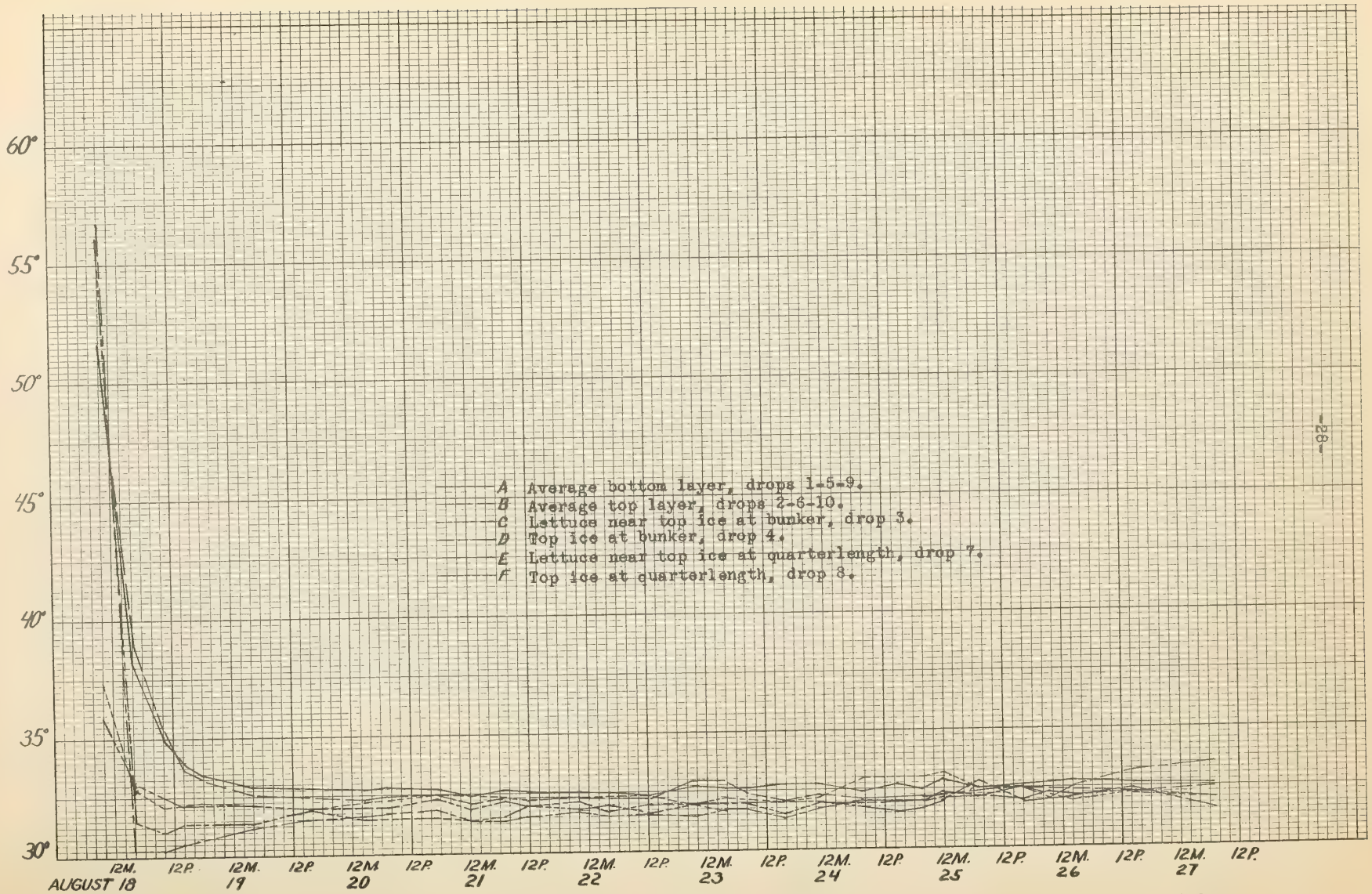

60°
55°
50°
45°
40°
35°
30°
A Average bottom layer, drops 1-5-9.
B Average top layer, drops 2-6-10.
C Lettuce near top ice at bunker, drop 3.
D Top ice at bunker, drop 4.
E Lettuce near top ice at quarterlength, drop 7.
F Top ice at quarterlength, drop 8.
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27
23

Fig. 11 - Temperature of Carrots in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939
Car R - Standard Type (Bulkheads Papered)

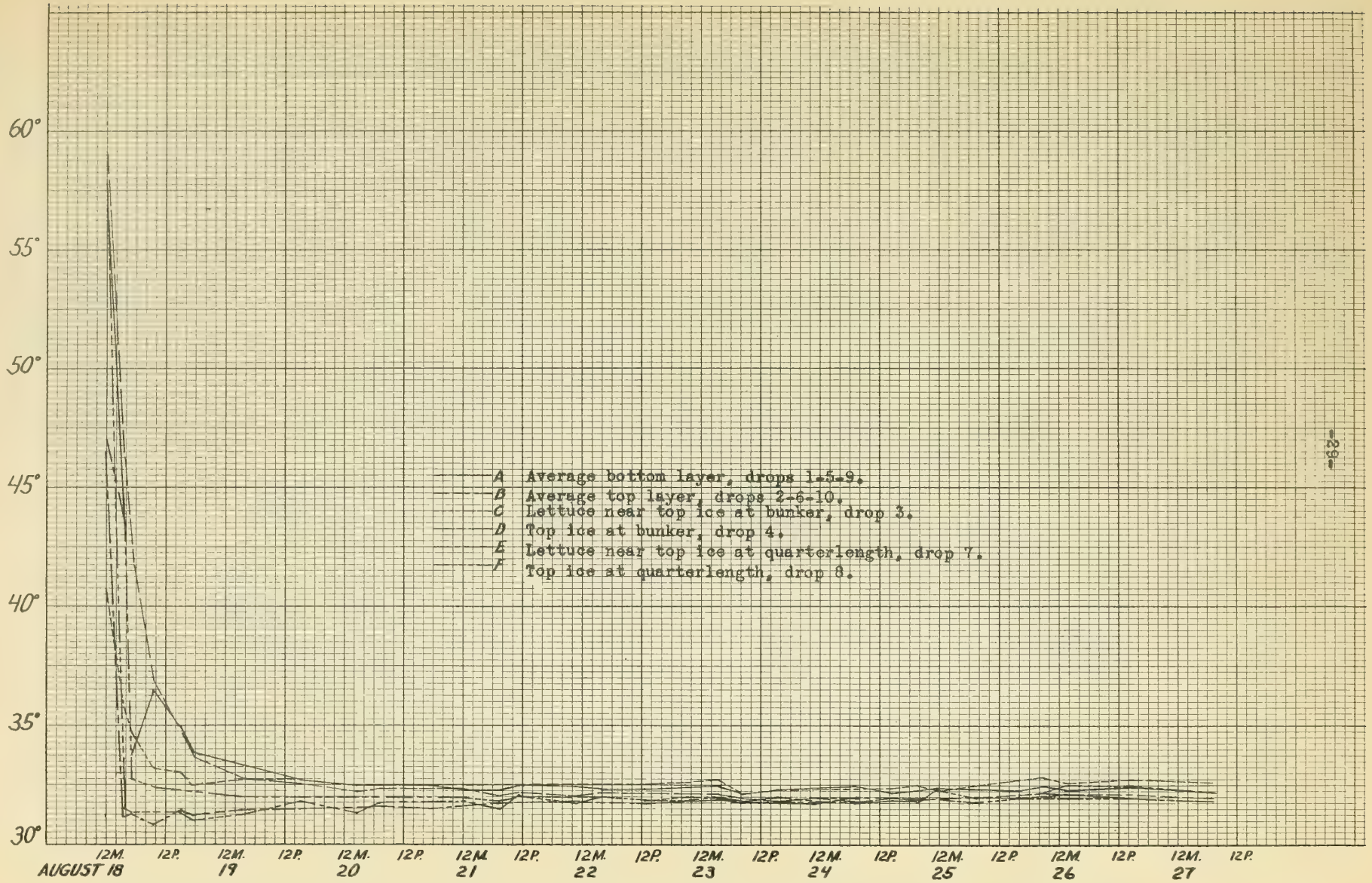

60°
55°
50°
45°
40°
35°
30°
A Average bottom layer, drops 1-5-9.
B Average top layer, drops 2-6-10.
C Lettuce near top ice at bunker, drop 3.
D Top ice at bunker, drop 4.
E Lettuce near top ice at quarterlength, drop 7.
F Top ice at quarterlength, drop 8.
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27

Fig. 12 - Temperature of Carrots in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939
Car S - Bunkerless Type

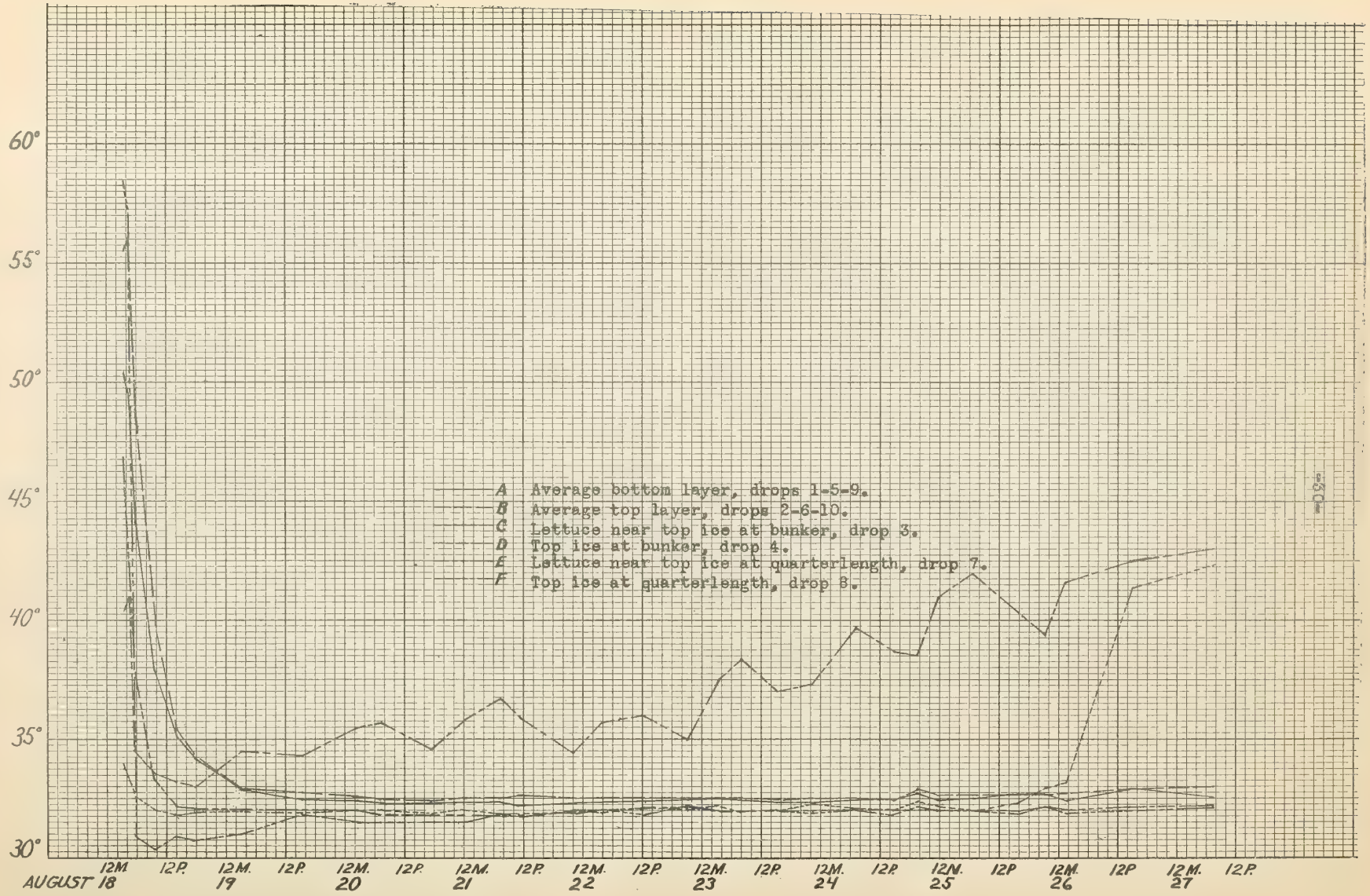

60°
55°
50°
45°
40°
35°
30°
A Average bottom layer, drops 1-5-9.
B Average top layer, drops 2-6-10.
C Lettuce near top ice at bunker, drop 3.
D Top ice at bunker, drop 4.
E Lettuce near top ice at quarterlength, drop 7.
F Top ice at quarterlength, drop 8.
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12N. 12P 12M. 12P 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27

Fig. 13 - Temperature of Carrots in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939
Car T - Giant Type (See footnote 1, table for T centerline in appendix)

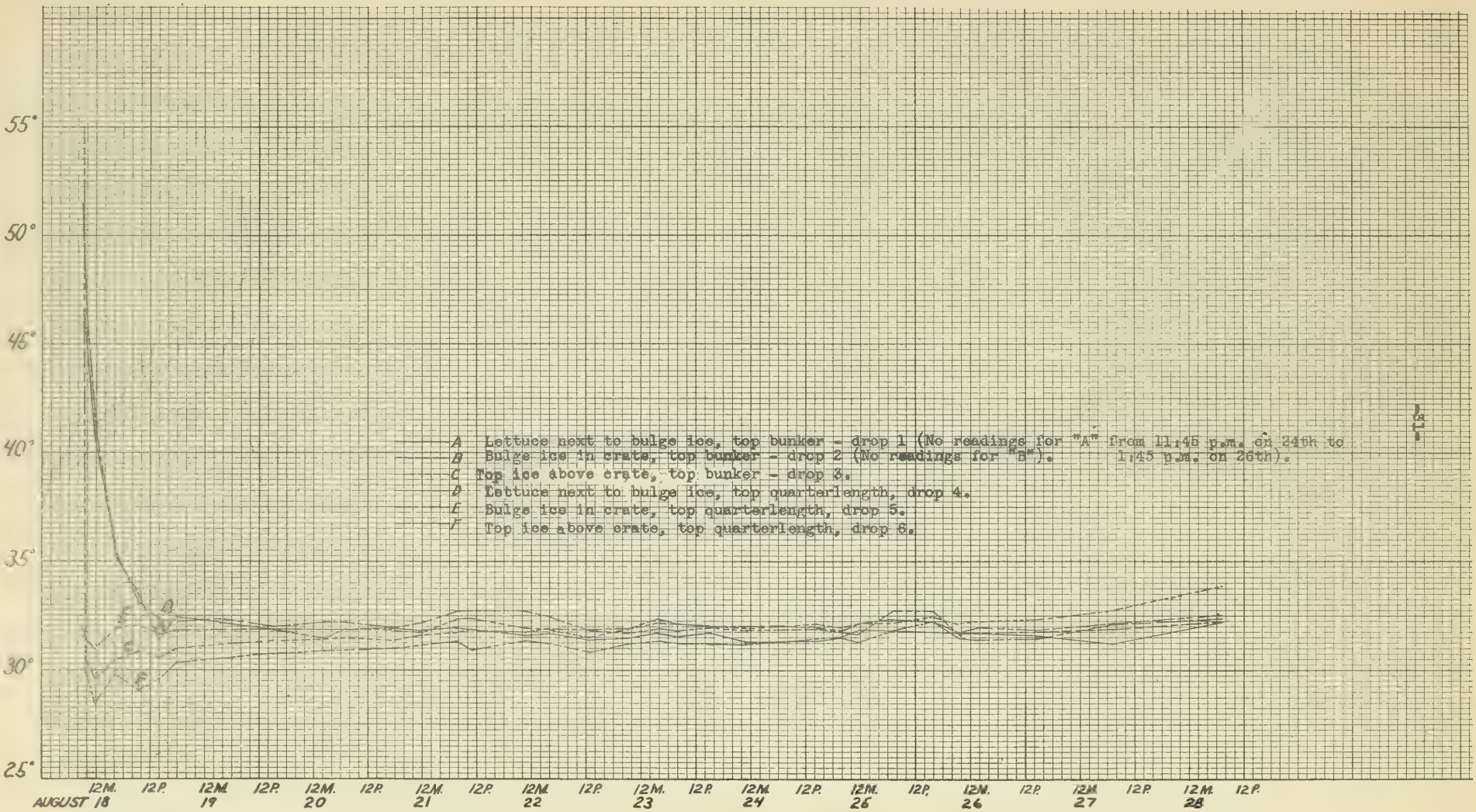

55°
50°
45°
40°
35°
30°
25°
A Lettuce next to bulge ice, top bunker - drop 1 (No readings for "A" from 11:45 p.m. on 24th to
B Bulge ice in crate, top bunker - drop 2 (No readings for "B"). 1:45 p.m. on 26th).
C Top ice above crate, top bunker - drop 3.
D Lettuce next to bulge ice, top quarterlength, drop 4.
E Bulge ice in crate, top quarterlength, drop 5.
F Top ice above crate, top quarterlength, drop 6.
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27 28

Fig. 14 - Temperature of Lettuce in Transit (Heads Next to Bulge Ice in Top Crates Loaded Upright) from Salinas, Calif. to New York City, Aug. 18 to 28, 1939

Car M - Standard Type

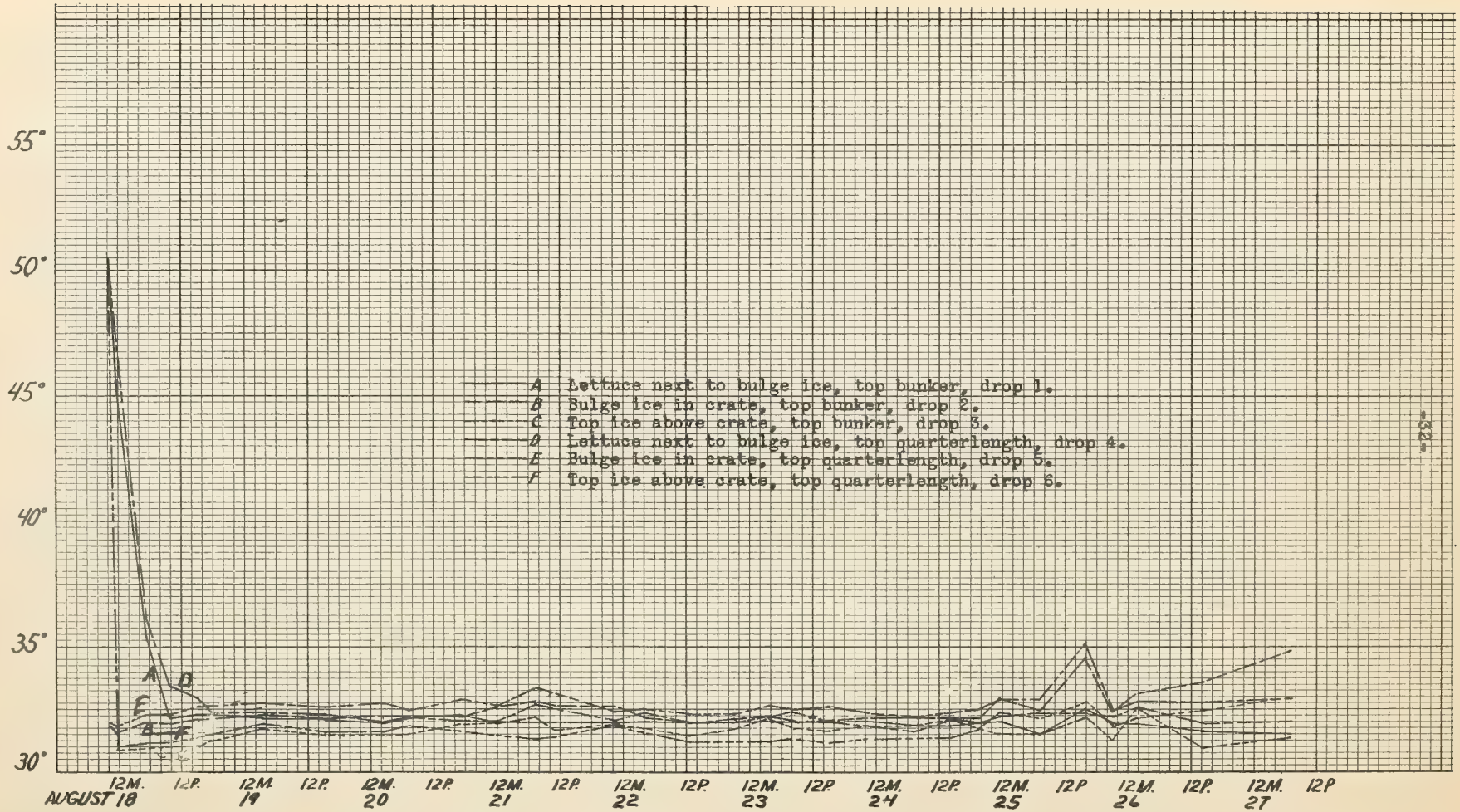

55°
50°
45°
40°
35°
30°
A Lettuce next to bulge ice, top bunker, drop 1.
B Bulge ice in crate, top bunker, drop 2.
C Top ice above crate, top bunker, drop 3.
D Lettuce next to bulge ice, top quarterlength, drop 4.
E Bulge ice in crate, top quarterlength, drop 5.
F Top ice above crate, top quarterlength, drop 6.
-32°
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P 12M. 12P. 12M. 12P
AUGUST 18 19 20 21 22 23 24 25 26 27

Fig. 15 - Temperature of Lettuce in Transit (Heads Next to Bulge Ice in Top Crates, Loaded Upright) from Salinas, Calif., to New York City, August 18 to 27, 1939

Car N - Bunkerless Type

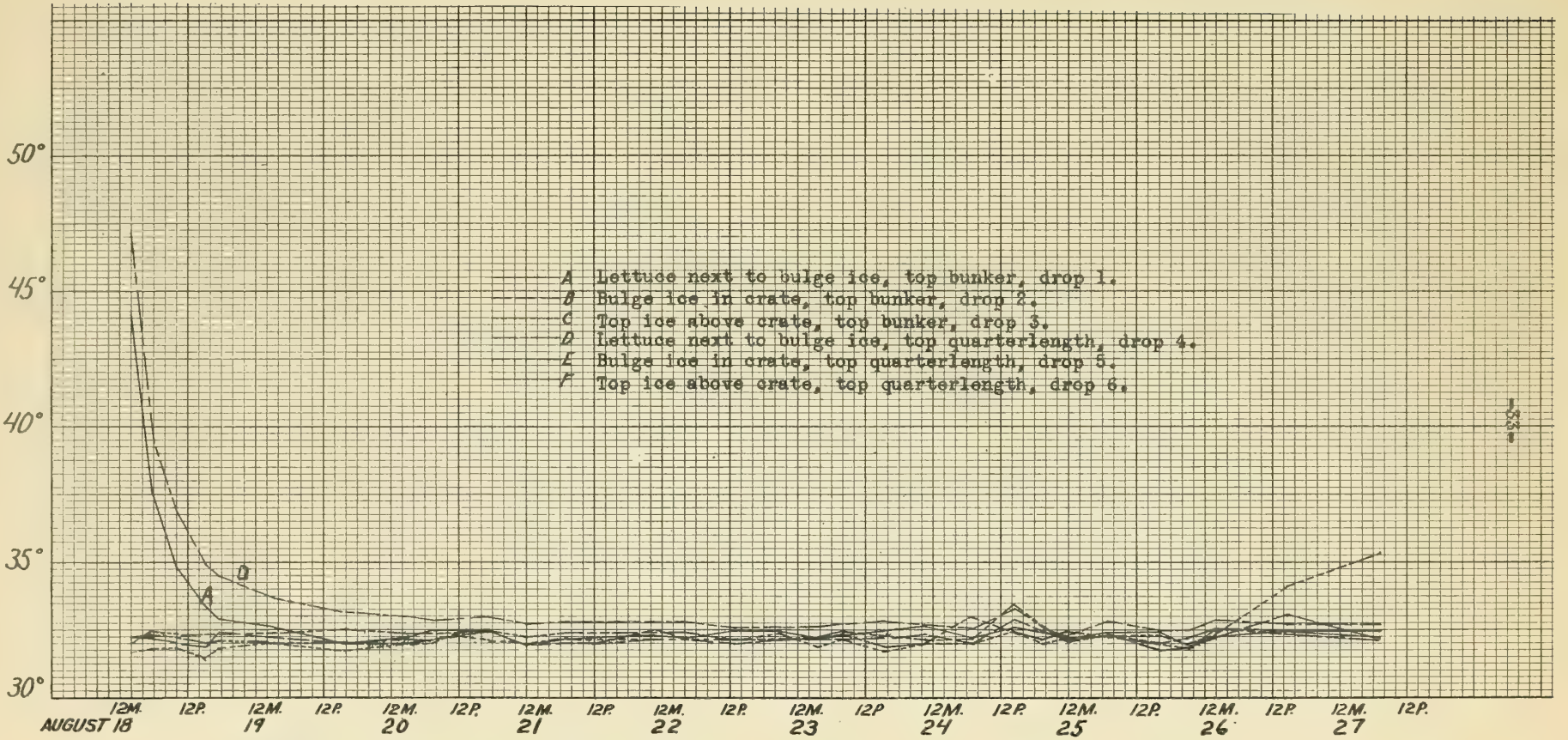

A Lettuce next to bulge ice, top bunker, drop 1.
B Bulge ice in crate, top bunker, drop 2.
C Top ice above crate, top bunker, drop 3.
D Lettuce next to bulge ice, top quarterlength, drop 4.
E Bulge ice in crate, top quarterlength, drop 5.
F Top ice above crate, top quarterlength, drop 6.
50°
45°
40°
35°
30°
D
A
12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P 12M. 12P. 12M. 12P. 12M. 12P. 12M. 12P.
AUGUST 18 19 20 21 22 23 24 25 26 27

Fig. 16 - Temperature of Lettuce in Transit (Heads Next to Bulge Ice in Top Crates Loaded Upright) from Salinas, Calif., to New York City, Aug. 18 to 27, 1939

Car P - Giant Type

toward the end of the trip it may have been due, at the end positions, to the top ice having melted. This can be noted in the data for nearly all cars.

Unless otherwise stated in the figures, all cars except R, S, and T (carrots) had no ice under the floor racks and no paper over the bulkhead openings.

Minimum Temperatures

In most cars, the lowest ice temperatures were found before arrival at Watsonville at 2:00 A.M. on the day following loading. Minimum commodity temperatures as low as 30° and 31° F. occurred before arrival at Sparks, Nevada, at 3:00 A.M. on the second day. (The freezing point of lettuce is about 31° F.) Cooling of the commodity along the centerline of the car to 35° or 36° (figures 2 to 13) was rapid and had occurred by the time the train arrived at Watsonville. The loads continued to cool gradually between Watsonville and Sparks. There was practically no change in lettuce temperature from Sparks to destination.

The minimum temperatures recorded probably do not represent the actual minimum temperatures of the lettuce, because the thermometers were pushed into the center of the heads, whereas the lowest temperature must have existed in the outer leaves which were nearest to the ice.

Influence of top ice on temperature of bulge ice

In group 4 (lettuce cars M, N, and P) where the top layer of crates was loaded in an upright position, cooling of bulge ice occurred following the use of low temperature top ice. The temperature of the bulge ice in the crates shown in figures 14 to 16 was about 32° before the cars were top iced. In car M (figure 14 E and F) the top ice over the top quarterlength crate was 28-1/2° for a short time and it cooled the bulge

ice in the crate 1° to a temperature of 31°. In car N (figure 15 E and F) where the minimum top ice temperature was about 31° the bulge ice cooled to a point 1/4° to 1/2° below 32° whereas in car P (figure 16) 31-1/2 to 32° top ice kept the bulge ice at 32°. The temperature of the top layer of heads in these crates was above 32° during the time the ice was the coldest but undoubtedly the temperature of the outer leaves was very nearly the same as that of the bulge ice because slight freezing occurred in the top layers of heads in cars M and N.

Temperatures throughout the loads

Lettuce temperatures in the crates along the centerline were between 30° and 36° F. throughout the trip and usually there was not more than a 3° range within a single car. Carrot temperatures near the centerline of the car ranged from 31.7° to 33.3° throughout most of the trip in all except car T (Giant). In this car the top bunker crate was 41.3° at Harismus Cove, N. J., and 42.3° at New York City, but it was cold at Enola, Pa., at 1:45 P.M. the previous day, having a temperature of 33.1°. With carrots loaded 6 rows wide many crates along the side walls of both the Standard and Bunkerless cars were 6° to 10° warmer than those in the center rows. A more uniform temperature was found in the Giant car. Its extra width resulting in recesses for ice between the rows and along the wall undoubtedly promoted better cooling than was possible in the narrower cars as is shown in figure 17 where the average temperature of the top, middle, and bottom layers of car S, (Bunkerless 8'-3" wide) is compared with that of car T (Giant 8'-11" wide). Two thermometers were placed in crates along the north wall of car R (Standard 8'-3" wide) and the temperatures in transit indicate

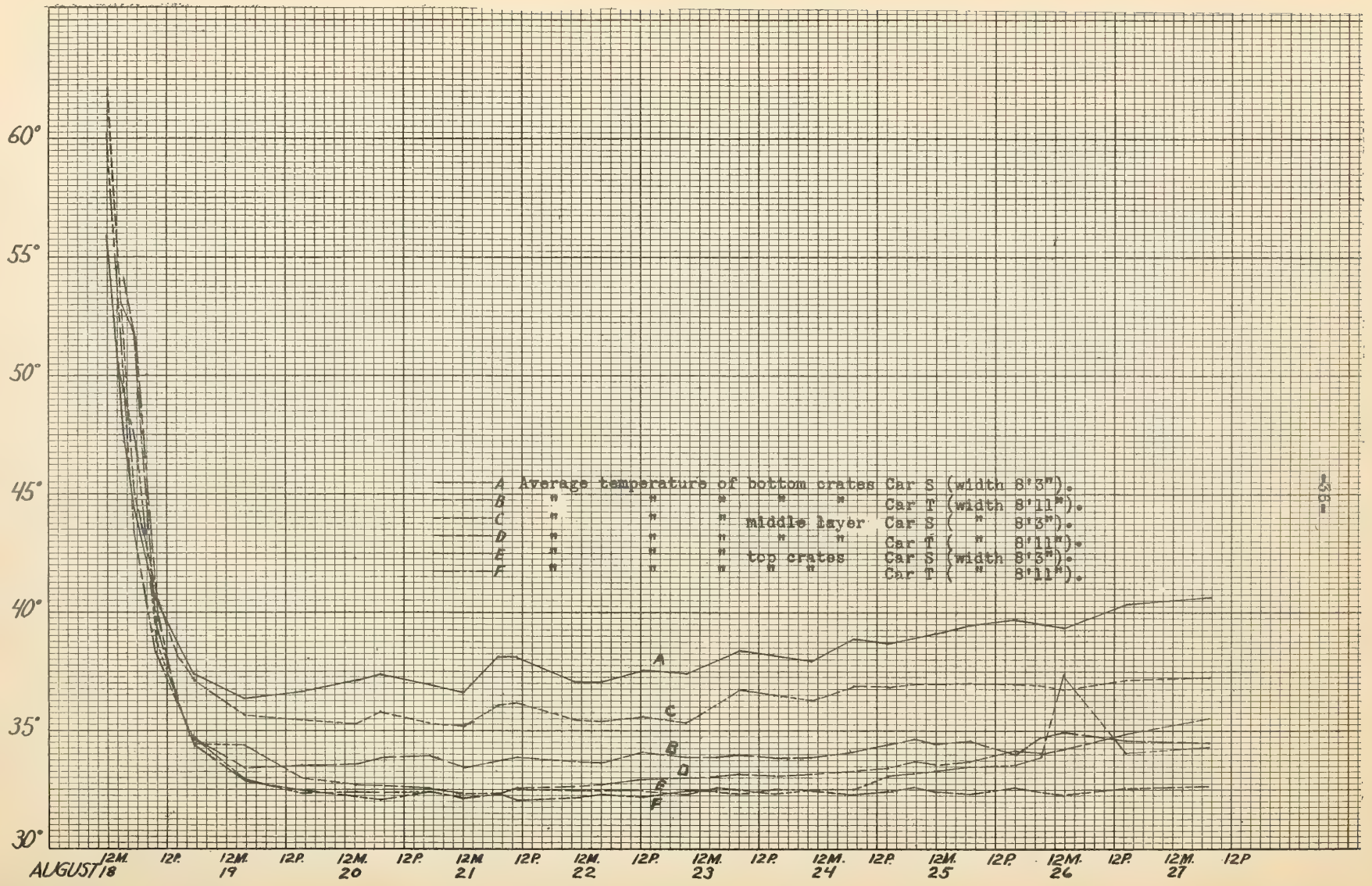

60°
55°
50°
45°
40°
35°
30°
A Average temperature of bottom crates Car S (width 8'3").
B " " " " " Car T (width 8'11").
C " " " middle layer Car S (" 8'3").
D " " " " " Car T (" 8'11").
E " " " top crates Car S (width 8'3").
F " " " " " Car T (" 8'11").
A
C
B
D
E
F
AUGUST 18 12M. 12P. 19 12M. 12P. 20 12M. 12P. 21 12M. 12P. 22 12M. 12P. 23 12M. 12P. 24 12M. 12P. 25 12M. 12P. 26 12M. 12P. 27 12M. 12P

Fig. 17 - Average Temperature of Carrots in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939
(Crates Along South Wall En Route)

that the bottom crates along the north wall when the load is 6 crates wide are likely to cool as slowly as those along the south wall (see figure 18). During August the sun frequently strikes the north side of cars along this route.

Relatively high temperatures along the wall may be guarded against by placing the crates with the bulge toward the wall. Bulge ice and more space for recess ice is then available for protection against heat conducted through the car walls. This was proved in comparison of these two methods of loading made with lettuce during the summer of 1936, the results of which showed that crates with the bulge toward the wall cooled somewhat faster and carried at a lower temperature than crates with the bottoms toward the wall.

Temperature of top ice and of lettuce in different layers of a crate

Table 7 includes the temperature of the center head of lettuce in the top, middle, and bottom layers of crate M-6 (top doorway crate of car M) together with the ice temperatures taken 2" above the lid, in the bulge, and between the top and middle layers of heads. In table 8 the temperature at similar points is shown for crate P-6 (top doorway crate of car P). Both crates were loaded in an upright position. The temperatures are taken from appendix 1.

Blocks of ice (300-pound size), some having a temperature as low as 20° F. were crushed for car M. The temperature of the ice over crate M-6 was 29° (table 7) soon after the doors were closed and remained unchanged for two hours, rising to 30.4° about 6-1/2 hours after loading and to 31.4° at Sparks, Nevada, early the second morning. The bottom layer of the crate did not cool quite as rapidly as the top, and the middle layer was intermediate in this respect. At Roseville the

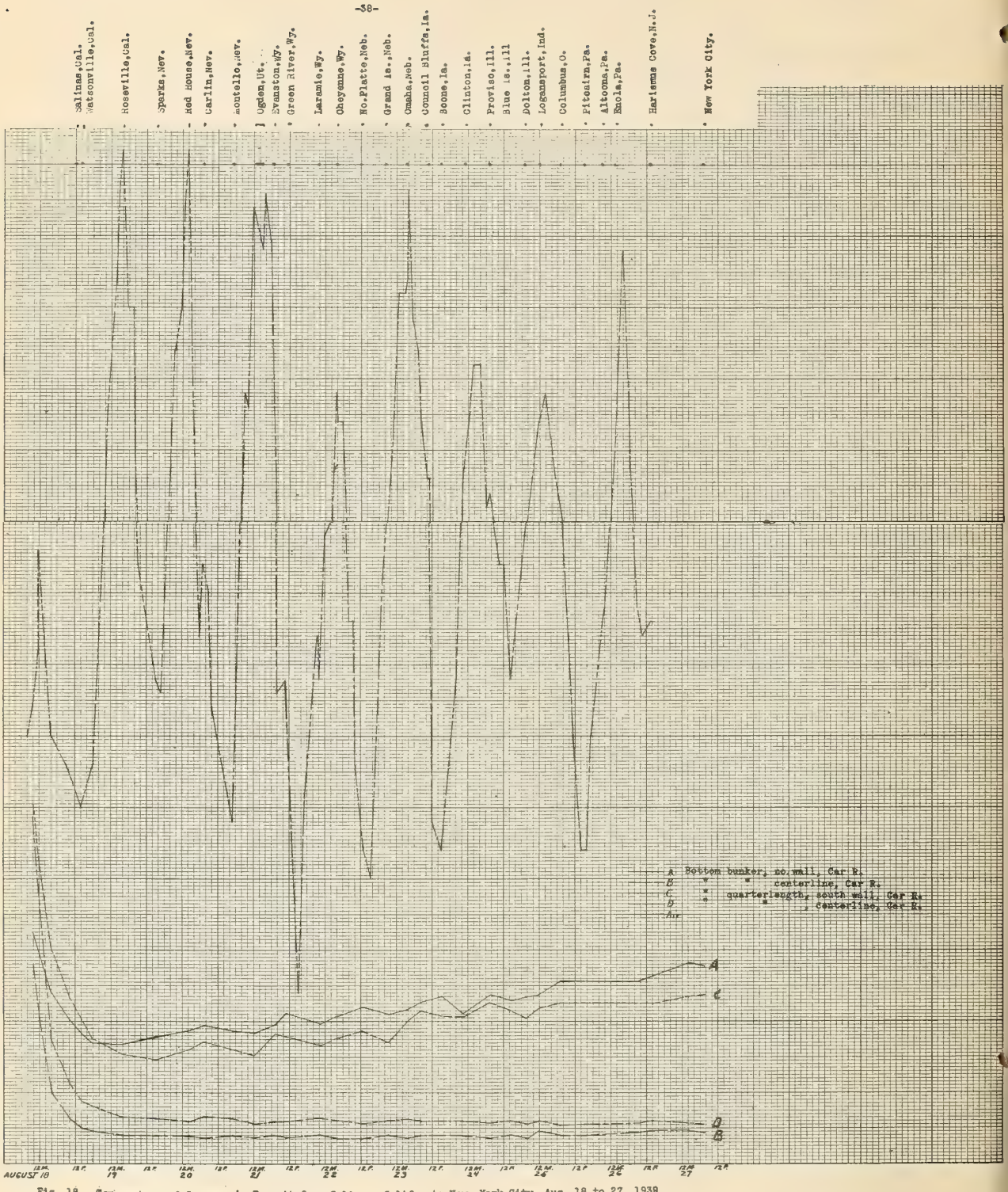


Fig. 18 - Temperature of Carrots in Transit from Salinas, Calif., to New York City, Aug. 18 to 27, 1939

Table 7. Temperature of Lettuce (center head) and Ice in Different Layers of Top Crate Loaded Upright.

Crate M6 (top crate, doorway stack, car M, standard)

Top iced at 9:20 AM

Place	Date	Time	Ice 2" above lid	Ice in bulge	Lettuce top layer	Ice between top&middle layers	Lettuce middle layer	Lettuce bottom layer
			°F. 1/	°F.	°F.	°F.	°F.	°F.
Salinas, Calif.	8/18	9:15A	55.0	32.5	52.1	32.0	51.0	49.5
" "	"	9:50A	29.0	32.0	47.6	32.6	46.7	41.0
" "	"	11:30A	29.0	31.5	41.1	32.6	41.3	40.0
" "	"	4:30P	30.4	31.8	34.4	33.8	35.5	36.7
" "	"	9:30P	30.5	31.9	33.1	33.3	34.0	35.5
Watsonville "	8/19	2:00A	31.0	31.8	31.9	32.6	33.3	34.3
San Jose "	"	5.45A	31.3	31.9	31.9	32.7	33.3	34.8
Roseville "	"	3:30P	31.4	31.8	31.8	32.7	33.2	33.8
Sparks, Nev.	8/20	3:15A	31.4	31.9	31.8	32.3	32.9	33.3
Red House "	"	2.20P	31.7	31.9	31.7	32.7	32.9	33.2
Carlin "	"	7:00P	31.9	31.9	31.5	32.8	32.7	33.0
Montello "	8/21	5:00A	31.8	31.9	31.4	32.8	32.9	33.0
Ogden, Utah	"	12:00N	31.7	32.0	31.5	32.8	32.9	33.2
Evanston, Wy.	"	7:00P	32.0	32.4	31.8	32.9	33.2	33.5
New York	8/27	7:00P	32.7	32.5	31.6	32.2	----	32.5
New York	8/28	7:00P	----	32.6	32.3	----	33.8	32.6

1/ Air temperature before top ice was added.

Table 8. Temperature of Lettuce (center head) and Ice in Different Layers of Top Crate Loaded Upright.

Crate P6 (top crate, doorway stack, car P, giant)
Top iced at 1:20 PM

Place	Date	Time	Ice 2" above lid	Ice in bulge	Lettuce top layer	Ice between top&middle layers	Lettuce middle layer	Lettuce bottom layer
			° F.	° F.	° F.	° F.	° F.	° F.
Salinas, Calif.	8/18	2:00P	31.3	32.2	47.0	48.5 1/	42.2	41.5
"		5:30P	31.6	32.2	38.5	39.5	37.9	39.1
"		10:00P	31.8	32.2	35.9	37.3	35.9	36.7
Watsonville	8/19	3:00A	31.3	31.8	34.5	35.8	34.3	35.2
San Jose		5:45A	31.8	32.0	33.4	55.0	34.0	34.2
Roseville		3:30P	31.7	32.0	32.7	33.8	32.7	33.0
Sparks, Nev.	8/20	3:15A	32.0	32.0	32.5	33.0	32.5	32.7
Red House		2:20P	31.7	32.0	32.2	32.8	32.3	32.5
Carlin		7:00P	31.8	32.1	32.0	32.7	32.4	32.7
Montello	8/21	5:00A	32.0	32.3	32.2	32.8	32.5	33.0
Ogden, Utah		12:00N	31.8	31.8	32.0	32.4	32.3	32.5
New York	8/27	7:00P	32.0	32.2	32.0	32.3	32.0	32.7

1/ The tip of the thermometer probably penetrated into a head of lettuce.

bottom layer was 2 degrees warmer than the top and at New York it was only 1 degree warmer. Ice over crate P-6 was about 32° (table 8) soon after loading. At Roseville the bottom and middle layers of crate P-6 were practically as cold as the same layers in crate M-6, showing that the colder ice of car M affected the top layer of lettuce only.

Comparison of temperatures in different cars

A comparison of commodity temperatures at comparable positions shows that all cars were practically the same from Roseville, Calif., to destination, and maintained good carrying temperatures for lettuce and carrots. Load temperatures prior to the arrival at Roseville were influenced by the temperature of the ice used in each car, low-temperature ice producing for a short time faster cooling and lower lettuce temperatures than warmer ice. The temperatures en route were similar to those in the Standard type car, PFE 17947, that was included in the test from Salinas to Chicago during August 1936, and was loaded similarly to the Standard cars used in the 1939 test, viz., 312 crates, 35 lbs. to 39 lbs. package ice per crate, 16,200 lbs. crushed top ice, 5 300-lb. blocks of ice at the doors, no bunker ice, and no reicing in transit. This car was built in 1920 and had not been reconditioned prior to the test. The load temperature in this car ranged from 31.8° to 33.4° at Watsonville and with slight fluctuations was maintained thus throughout the trip.

Transit temperature as affected by "papered" bulkheads

The bulkhead openings of Standard car R were covered with heavy paper. The purpose was to prevent drafts of outside air that might leak in around the hatch plugs from penetrating the load. Standard car A destined to the same market as car R was not so papered. Top

layer temperatures along the centerline were practically the same for both cars for the entire trip (figures 8, 11).

Transit temperature as affected by ice under floor racks

In group 3 (cars A, H, K), 1800 to 2100 pounds of crushed ice were placed under the floor racks prior to loading, for comparison with group 1 (cars G, B, C), in which no floor ice was used. Both groups were loaded at the same packing house. The bottom layer crates of car A (Standard, with ice under the floor rack) had an average temperature of about 32.4° F. at Watsonville (figure 8), whereas the average temperature of the bottom layer of car G (standard, without floor ice) did not reach 33° until several hours later and ranged between 33° and 35.5° during the remainder of the trip (figure 2). Similar slightly faster cooling of the bottom layers in cars H and K (Bunkerless and Giant and floor ice, figures 9 and 10) was observed than in cars B and C (similar types without floor ice, figures 3 and 4).

Influence of outside temperatures

The natural fluctuation in outside temperature (15 to 56° F.) between day and night (table 6) was reflected in a rise and fall of 1° to 2° in the temperature above the load which probably influenced the rate at which the top ice melted but apparently had little or no influence on the temperature of the lettuce or carrots.

Temperature of "hold over" loads at destination

Several cars were not unloaded until a day or more after arrival. Load temperatures of car M were taken one day after arrival at New York (figure 14) or 10 days after loading; temperatures of car D were taken at Baltimore on the 10th and 11th days after loading (figure 5); temperatures of car E were taken at Philadelphia on the 9th and 12th

days after loading (figure 6). In all these cars the load did not warm up more than 2° or 3° during the hold-over period.

Meltage of top ice

Table 9 shows the meltage of top ice noted after arrival at destination. Meltage in all cars was slightly more at the side walls than along the center of the car. Most meltage occurred at the ends of the car, there being little difference between the two ends. Relatively less ice was found near the doors than elsewhere in the middle of the car. This condition was much more pronounced at the loading doorway through which the ice was blown than at the opposite doorway.

Meltage excluding that over the two end stacks

At destination the top ice was found to slope gently toward the end stacks and then abruptly downward. Meltage over all but the two end stacks amounted to 2 to 4 inches in both the Standard and the Giant cars at Chicago and 3 to 5 inches in the Bunkerless car at this market. At the more distant markets meltage in Standard cars amounted to 3 to 7 inches along the centerline and 3 to 8 inches along the wall; in Bunkerless cars 3 to 9 inches along the centerline and also 3 to 9 inches along the wall and in Giant cars 3 to 7 inches along the centerline and 3 to 6 inches along the wall. The Bunkerless car (S) containing carrots had only 4 to 5 inches meltage over the main portion of the load.

Meltage of ice over the two end stacks

At Chicago, the ice over the two end stacks of the Standard and Bunkerless cars was nearly as deep as that over the rest of the load, averaging about 10 inches in thickness. In the Giant car, ice had melted away for short distances at the ends of the car and along one side wall, exposing the upper edges of the top crates of one stack

Table 9. Top-ice meltage in test cars as recorded at destination. Loaded August 18, 1939.

Car	Commodity	Type of car	Date unloaded	Meltage in inches: Along centerline excluding 2 end stacks	Alongside southwall excluding 2 end stacks	Alongside northwall excluding 2 end stacks	First stack, east end of car	Second stack, east end of car	First stack, west end of car	Second stack, west end of car
A	Lettuce	Standard	8/27	7"	5"	7"	11"-5"	5"	2 crts.13" 3 crts 1/2"	6"
H	Lettuce	Bunkerless	8/27	7"-9"	7"-9"	7"-9"	1/	14"-9"	1/	11 1/2"-11"
K	Lettuce	Giant	8/27	3"-5"	3"-5"	3"-5"	3/4 stack 10"-12"	2/3 stack 10"-12"	3/4 stack 10"-12"	2/3 stack 10"-12"
M	Lettuce	Standard	8/28	3"-5"	3"-5"	3"-5"	1/2 crt.10"-9" 1/2 crt. 9"-18"	8"-9"	16"-9"	8"-9"
N	Lettuce	Bunkerless	8/27-28	3"-5"	3"-5"	3"-5"	Ends bare then up 3"-5"	3"-5"	14" to scattered ice	4"-5" at crt. line.
P	Lettuce	Giant	8/27	3"-6"	3"-6"	3"-6"	3/4 stack 14"-12"	2/3 stack 14"-12"	3/4 stack 14"-12"	2/3 stack 14"-12"
R	Carrots	Standard	8/27-28	4"-7"	4"-7"	4"-7"	2/	7"-8"	2/	7"-8"
S	Carrots	Bunkerless	8/27-28	4"-5"	4"-5"	4"-5"	4"-8" 3/	4"-6"	4"-8" 3/	4"-6"
T	Carrots	Giant	8/27	3"	7"	7"	9"-12"	9"-12"	9"-12"	9"-12"
G	Lettuce	Standard	8/25	2"-4"	2"-4"	2"-4"				
B	Lettuce	Bunkerless	8/25	3"-5"	3"-5"	3"-5"				
C	Lettuce	Giant	8/25	2"-4"	2"-4"	2"-4"	3"-4"	3"-4"	3"-4"	3"-4"
D	Lettuce	Standard	8/29	3"-6"	3"-5"	4"-8"	1"-10"	1"-5"	1"-10"	1"-5"
E	Lettuce	Bunkerless	8/30	4"	4"	4"	1/4 stack 12"	4"	1/4 stack 12"	4"
F	Lettuce	Giant	8/28	4"-5"	4"-5"	4"-5"	1/4 stack 12"	3"	1/4 stack 12"	3"

1/ Crates partly bare with ice scattered in small cakes.
2/ Corner crates bare, crushed ice in cakes scattered over other crates.
3/ One-third of crates bare, remaining portion covered.
Car R had top bulkhead openings papered; all other standard cars had bulkhead openings open.
All Giant cars had collapsible bulkheads open.

at each end of the car and likewise the top edge of one outside row.

Meltage at the ends of the cars was slightly greater at New York than at the other markets. In the Standard and Bunkerless cars noticeable meltage occurred for a short distance in from the ends of the car or over the corners of the load but did not totally uncover the first stack of crates. In the Giant cars the top ice was either thin or melted away over the first and portions of the second stack at each end of the car.

Whenever ice meltage was great enough to partly expose top crates it must have occurred very late in the trip because the temperature of most of the top bunker crates did not rise materially prior to unloading. Although no difference in the condition of the commodity was found in exposed and in well-covered crates, the presence at destination of a large amount of top ice in the ends of cars may be commercially desirable. To accomplish this, the use of block ice fitted compactly over the two end stacks may be feasible. Block ice would give a maximum quantity at this point to offset the extra inward heat leakage that is apparently normal for all cars. 2/

Condition of lettuce at destination

The average condition of the lettuce at destination as observed by various inspection agencies and the results of inspection of individual crates by the Government investigators are shown in tables 10a, b, c, and d.

2/ Since this work was done the National Perishable Freight Committee has recommended approval of a rule "that pieces of ice not to exceed 100 pounds be used in top icing at the bunker ends of the car."

Table 10a. Condition of Lettuce at Destination

Count 4 and 5 dozen heads per crate

Car /1	Destination	Days after Loading	Location in Car	Decay %	Degree of Discoloration		Bruising	Freezing attributed to			Leaves /5 affected & degree	Meltage of Pkge. Ice	Inspection Agency /6
					Butts	Midribs		Top ice /2 Heads	Recess Ice /3 Heads	Pkge. Ice /4 Heads			
D	Baltimore	11	Average	0	----	----	Severe	All	Most	Few	2-8 S	----	3
E	Philadelphia	12	Average	2	Slight	Slight	15%	All	Many	Many	2-8	Slight	2
E	Philadelphia	12	Top Door (Sidewall)	-	----	----	---	All	All	All	3-6	"	4
			Top Door (Centerline)	-	Slight	Slight	Severe	All	Many	4	1-6	"	4
			Top Door "	-	"	"	"	All	Many	?	1-5	"	4
			3rd Door "	-	"	"	"	None	Many	?	1	"	4
			Bot. Door "	-	"	"	"	None	Most	?	1-2 S	"	4
			Top 1/4 (Sidewall)	-	"	"	"	Most	Most	?	1-6 S	"	4
			Top 1/4 (Centerline)	-	"	"	"	Most	Most	?	2-7 S	"	4
			3rd 1/4 "	-	"	"	"	None	Many	?	1-4	"	4
			Bot. 1/4 "	-	"	"	"	None	?	7	1 S	"	4
			Top Bunk. "	-	"	"	"	Most	Most	?	1-7	"	4
			Bot. Bunk. "	-	"	"	"	None	None	None	0	"	4
F	Philadelphia	10	Average	1	Slight	Slight	45%	Most	----	----	1-4	Slight	2
			Top Door (Sidewall)	-	"	"	Very severe	Most	----	----	3-4	"	4
			Top Door (Centerline)	-	"	"	"	All	----	1	1-4	"	4
			Bot. Door "	-	"	"	"	None	None	None	0	Moderate	4
			Top 1/4 "	-	"	"	"	All	----	5	1-4	Slight	4
			Bot. 1/4 "	-	"	"	"	None	None	None	0	"	4
			Top Bunk (Sidewall)	-	"	"	"	3	None	None	1-2	"	4
			Top Bunk (Centerline)	-	"	"	"	None	None	None	0	"	4
			Bot. Bunk "	-	"	"	"	None	None	None	0	"	4

/1 In groups of 3 cars from the same shipper and listed according to type in the following order: Standard, Bunkerless, Giant.

/2 As affecting heads in layer next to top ice.

/3 As affecting vertical layers of heads next to recess ice.

/4 As affecting heads in the interior of the crates.

/5 Individual leaves near recess ice, whorls of leaves near package ice and top ice except when top layer crate is loaded on edge. Degree on leaf area affected: S=small; M=medium; L=large.

/6 1 = shippers' representatives.
2 = Agricultural Marketing Service.
3 = Railway Perishable Inspection Agency.
4 = Government investigators.

Table 10b. Condition of Lettuce at Destination

Count 4 and 5 dozen heads per crate

Car /1	Destination	Days after Loading	Location in Car	Decay %	Degree of Discoloration		Bruising	Freezing attributed to -			Leaves/5 affected & degree	Meltage of Pkge. Ice	Inspection Agency/6
					Butts	Midribs		Top ice/2 Heads	Recess ice/3 Heads	Pkge. ice/4 Heads			
A	New York	9	Average	2	Slight	None	----	----	----	----	---	Slight	2
A	New York	9	Average	1	----	----	----	Most	None	None	2-6	Moderate	3
A	New York	9	Top Door (Centerline)	0	Slight	None	None	8	None	None	2-5 M-L	Moderate	4
			Bot. Door "	0	Very slight	Very slight	Slight	None	None	None	0	Moderate	4
			Top 1/4 "	0	Slight	None	None	8	None	None	2-3 M-L	Moderate	4
			Bot. 1/4 "	0	Very slight	None	None	None	None	None	0	Slight	4
			Top Bunk. "	0	Very slight	None	None	11	None	None	2-3 M-L	Slight	4
H	New York	9	Average	0	Very slight	None	None	Most	None	None	2-4	Moderate	2
H	New York	9	Average	0	----	----	----	Most	None	None	2-4	Moderate	3
H	New York	9	Top Door (Centerline)	0	Very slight	None	None	Many	None	None	1-3 M	Slight	4
			Bot. Door "	0	Very slight	None	None	None	None	None	0	Slight	4
			Top 1/4 "	0	Very slight	None	None	Many	None	None	1-3 M	Slight	4
			Top Bunk. "	0	Very slight	None	None	12	None	None	2-3 M	Slight	4
			Bot. Bunk. "	0	Very slight	None	None	None	None	None	0	Slight	4
K	New York	9	Average	2	Very slight	None	None	Many	None	None	1-3	Moderate	2
K	New York	9	Average	2	Very slight	None	None	Most	None	None	1-3	Moderate	3
K	New York	9	Bot. Door (Centerline)	0	Very slight	None	None	None	None	None	0	Moderate	4
			Top 1/4 "	0	Very slight	None	None	All	None	None	1-3 M	Moderate	4
			Bot. 1/4 "	0	Very slight	None	None	None	None	None	0	Moderate	4
			Top Bunk. "	0	Very slight	None	None	All	None	None	1-3 M	Moderate	4
			Bot. Bunk. "	0	Very slight	None	None	None	None	None	0	Moderate	4

/1 In groups of 3 cars from the same shipper and listed according to type in the following order: Standard, Bunkerless, Giant.

/2 As affecting heads in layer next to top ice.

/3 As affecting vertical layers of heads next to recess ice.

/4 As affecting heads in the interior of the crates.

/5 Individual leaves near recess ice, whorls of leaves near package ice and top ice except when top layer crate is loaded on edge. Degree of leaf area affected: S=small; M=medium; L=large.

/6 1 = Shippers' representatives.
2 = Agricultural Marketing Service.
3 = Railway Perishable Inspection Agency.
4 = Government investigators.

Table 10c. Condition of Lettuce at Destination

Count 4 and 5 dozen heads per crate

Car /1	Destination	Days after Loading	Location in Car	Decay %	Degree of Discoloration		Bruising	Freezing attributed to			Leaves/5 affected & degree	Meltage of Pkge. Ice	Inspection Agency/6
					Butts	Midribs		Top ice/2 Heads	Recess ice/3 Heads	Pkge. ice/4 Heads			
M	New York	10	Average	2	----	----	----	Most	None	None	1-3	Moderate	2
M	New York	10	Average	3	----	----	----	Most	None	None	2-4	Moderate	3
M	New York	10	Top Door (Centerline)	0	Slight	None	None	All	None	None	3-5 S	Slight	4
			Top 1/4 (Southwall)	0	"	"	"	All	None	None	3-5 S	One third	4
			Top 1/4 (Centerline)	4	"	"	"	All	None	None	3-5 S	Moderate	4
			Bot. 1/4 (Centerline)	0	"	"	"	None	None	None	0	Moderate	4
			Top Bunk. "	0	Moderate	"	"	All	None	None	3-5 S	Moderate	4
			Bot. Bunk. "	0	Slight	Slight	Slight	None	None	None	0	"	4
N	New York	9	Average	2	Very slight	---	----	----	----	----	-	"	2
N	New York	9	Average	3	"	----	None	Most	None	None	2-5	"	3
N	New York	9	Top Door (Centerline)	0	Slight	None	None	All	None	None	3-4 S	"	4
			Bot. Door "	0	"	"	"	None	None	None	0	Severe	4
			Top 1/4 "	0	Moderate	"	"	All	None	None	2-3 S	Moderate	4
			Bot. 1/4 (Southwall)	0	"	"	"	None	None	None	0	"	4
			Bot. 1/4 (Centerline)	0	"	"	"	None	None	None	0	"	4
			Top Bunk. "	0	Slight	"	"	All	None	None	3-4 S	"	4
P	New York	9	Average	0	Very slight	----	----	----	----	----	-	"	2
P	New York	9	Average	3	"	None	None	----	----	----	-	"	3
P	New York	9	Top Door (Centerline)	2	"	"	"	None	None	None	0	"	4
			Bot. door "	0	"	"	"	None	None	None	0	"	4
			Top 1/4 "	0	"	"	"	None	None	None	0	"	4
			Bot. Door "	0	"	"	"	None	None	None	0	"	4
			Top Bunk. "	0	"	"	"	None	None	None	0	Slight	4
			Bot. Bunk. "	0	"	"	"	None	None	None	0	"	4

/1 In groups of 3 cars from the same shipper and listed according to type in the following order: Standard, Bunkerless, Giant.

/2 As affecting heads in layer next to top ice.

/3 As affecting vertical layers of heads next to recess ice.

/4 As affecting heads in the interior of the crates.

/5 Individual leaves near recess ice, whorls of leaves near package ice and top ice except when top layer crate is loaded on edge. Degree on leaf area affected: S=small; M= medium; L=large.

/6 1 = Shippers' representatives.
2 = Agricultural Marketing Service.
3 = Railway Perishable Inspection Agency.
4 = Government investigators.

Table 10d. Condition of Lettuce at Destination

Count 4 and 5 dozen heads per crate

Car /1	Destination	Days after Loading	Location in Car	Decay %	Degree of Discoloration		Bruising	Freezing attributed to			Leaves/5 affected & degree	Meltage of Pkge. Ice	Inspection Agency/6
					Butts	Midribs		Top ice/2 Heads	Recess ice/3 Heads	Pkge. ice/4 Heads			
G	Chicago	7	Average	0	Very slight	None	Slight	Many	None	None	1-4	15%	1
G	Chicago	7	Average	0	Very slight	----	----	2-5	None	None	1-2 S	Slight	2
G	Chicago	7	Top Door (Centerline)	0	Very slight	Very slight	Slight	8	None	None	1-3 M	Slight	4
			Bot. Door " 0	0	"	"	Slight	None	None	None	0	----	4
			Top 1/4 "	0	"	"	Slight	9	None	None	1-3 S-M	Very slight	4
			Bot. 1/4 "	0	----	----	----	None	None	3	1-2 S	Very slight	4
			Top Bunk. "	0	None	None	None	5	None	None	2	Very slight	4
			Bot. Bunk. "	0	None	None	10 heads	None	None	None	0	----	4
B	Chicago	7	Average	0	Very slight	None	Slight	Few	None	None	1-3 S	15%	1
B	Chicago	7	Average	0	Very slight	Very slight	----	2-4	None	None	1-2 S	Slight	2
B	Chicago	7	Top Door (Centerline)	0	Slight	----	Slight	3	None	None	2 S	Very slight	4
			Bot. Door "	0	----	-----	Slight	None	None	None	0	----	4
			Top 1/4 "	0	Slight	----	----	4	None	None	2 S	Very slight	4
			Bot. 1/4 "	0	None	None	----	None	None	None	0	----	4
			Top Bunk. "	0	----	----	None	2	None	None	2 S	Very slight	4
			Bot. Bunk. "	0	None	None	Slight	None	None	None	0	----	4
C	Chicago	7	Average	0	Very slight	None	Slight	Few	None	None	1-3 S	15%	1
C	Chicago	7	Average	0	Very slight	Very slight	----	1-5	None	None	1-2 S	Slight	2
C	Chicago	7	Top Door (Centerline)	0	Very slight	----	----	5	None	None	1-2 S	Very slight	4
			Bot. Door "	0	None	None	None	None	None	None	0	----	4
			Top 1/4 "	0	----	----	----	3	None	None	2 S	Very slight	4
			Bot. 1/4 "	0	Very slight	Very slight	Slight	None	None	None	0	Very slight	4
			Top Bunk. "	0	None	None	None	2	None	None	1 S	Very slight	4
			Bot. Bunk. "	0	None	None	Very slight	None	None	None	0	Very slight	4

/1 In groups of 3 cars from the same shipper and listed according to type in the following order: Standard, Bunkerless, Giant.

/2 As affecting heads in layer next to top ice.

/3 As affecting vertical layers of heads next to recess ice.

/4 As affecting heads in the interior of the crates.

/5 Individual leaves near recess ice, whorls of leaves near package ice and top ice except when top layer crate is loaded on edge. Degree of leaf area affected: S=small; M=medium; L=large.

/6 1 = Shippers' representatives.
2 = Agricultural Marketing Service.
3 = Railway Perishable Inspection Agency.
4 = Government investigators.

Bruising

Severely bruised lettuce was found only in the cars of group 2 (cars D, E, and F, Philadelphia and Baltimore), in which it amounted to between 15% and 45%. Generally, the bruised areas occurred near the base of the leaves and were red in color. Paper separators were not used between the lettuce and the package ice in this group and many leaves were injured, apparently by contact with sharp particles of ice. In groups 1 and 3 (cars G, B, C, A, H, and K) paper was used to keep the bulge ice from coming in contact with the top layer of lettuce and no bruising occurred. Group 4 (cars M, N, and P) in which paper was used over all layers also arrived sound. Paper separators materially reduced the amount of bruising but the position in the crate of injured heads when separators were not used indicates that if the amount of bulge ice and the pressure exerted by the lidding machine on the top layer of heads are excessive, injury may occur despite the use of separators.

Decay

No decay was reported at either Chicago or Baltimore. At New York and Philadelphia all of the cars except car H (Bunkerless type, in which the lettuce was sound) were found to have 1 to 3 percent decay (early stages of bacterial soft rot or slime following tip burn). Decay was not confined to any particular location in the car. Temperatures below 35° F. which generally prevailed en route were sufficiently low to prevent the development of serious decay.

Discoloration

Discoloration of the midribs was of no consequence except in the severely bruised heads in cars of the Philadelphia-Baltimore group.

Discoloration of the butts was of little consequence in this test. It was reported to be very slight on the 7th morning at Chicago, and slight at the eastern destinations on the 9th, 10th, 11th, and 12th days after loading. No severe discoloration was found and the few instances of moderate discoloration were not confined to any particular location in the car. It is possible that besides time in transit and temperature there may be other factors tending to cause lettuce to discolor.

Freezing

Freezing occurred in all lettuce cars except car P. Under the active market that prevailed at the time the degree of freezing was not considered serious by the trade at Chicago and New York, probably because freezing was generally confined to the heads directly beneath the top ice and because the area of frozen (transparent) tissue per leaf was small. Freezing occurred throughout the loads of the Philadelphia-Baltimore cars D, E, and F, penetrating the heads to a depth of 8 leaves in instances where the head was close to top and recess ice and to a lesser depth in other heads. Some lettuce in the interior of these crates was apparently frozen by contact with low temperature package ice.

Whenever the top crates were loaded upright thereby placing the butts of the entire top layer of heads close to low temperature top ice the bases of all leaves in several whorls were usually frozen whereas in top crates loaded on their sides freezing was confined to the side of the head closest to the top ice.

The effect of ice temperature on the amount and degree of freezing is not clearly shown in this test but there is no doubt that the ice used in all lettuce cars except car P caused freezing damage. The ice

supplied to car P was warmer than that supplied to companion cars M and N and came from an ice plant which was freezing ice quickly, leaving large hollow spaces at the center of the cakes.

Condition of carrots at destination

All three cars of carrots (cars R, S, and T) arrived in the same condition; viz., tops green and fresh, roots firm and crisp, no decay, no freezing. Carrots apparently withstood, without injury, temperatures that froze lettuce.

Although there was practically no package ice remaining at destination in many crates loaded next to the walls, the condition of the carrots in these crates was the same as of those in inner row crates that showed less meltage of package ice. Carrots that had transit temperatures of 40° to 45° arrived in New York in good condition.

Selling prices

The prices obtained for the lettuce and carrots in the test cars appear in table 11. All the carrots sold at the same price ($3.50 per crate). Prices of $3.35 to $3.75 per crate were realized on 4-dozen size lettuce at Chicago and $3.85 to $3.94 on the 5-dozen size. At New York 4-dozens brought $3.65 to $4.25 and 5-dozens brought $4.10 to $4.75. The differences in price were not traceable to any type of car used although the amount of freezing injury probably affected the selling price to some extent.

Summary

The test cars originated at Salinas, California, and were routed via S.P., U.P., C. & N.W., I.H.B., and Penn., 9 of them going to New York, 3 to Chicago, 2 to Philadelphia, and 1 to Baltimore. All 15 left

Table 11. Selling Price of Lettuce and Carrots in Test Cars.

Car	Type	Shipper	Receiver	Crates of 4 doz. heads	Crates of 5 doz. heads
				$	$
M	Standard	Myers	Wishnatzki & Nathel, New York	4.25	4.75
N	Bunkerless	"	Wm. Shapiro, New York	4.25	4.50
P	Giant	"	Carbone Bros. & Co., New York	4.25	4.40
A	Standard	Church	Yeckes-Eichenbaum, New York	3.78	4.25
H	Bunkerless	"	" " " "	4.00	4.48
K	Giant	"	" " " "	3.65	4.10
G	Standard	Church	M. Lapidus, Chicago	3.35-3.40	3.85-3.90
B	Bunkerless	"	" "	3.35-3.40	3.85
C	Giant	"	LaMantia Bros., Chicago	3.75	3.94
	Carrots in all three cars, R, S, and T, sold at New York for $3.50 per crate.				

Salinas about midnight August 18, and the New York cars arrived August 27.

Load temperatures were taken en route in nine cars of body-iced lettuce and three cars of body-iced carrots containing electric resistance thermometers and recording thermometers.

Observations were made on the melting down of the blanket of top ice and temperature and condition of the commodity as affected by low-temperature body ice and by different packing and loading practices such as the use of paper between layers in crates, the papering of bulkheads, and the use of ice under the floor racks of the cars in three types of refrigerator cars.

By using long cars to provide space for extra crates without increasing the height of the load, heavy loads which in some instances consisted of 100 crates more than a standard load were delivered at New York in the same condition as standard loads.

All cars maintained the load at temperatures that have been found desirable for these commodities in transit, and carried them to market in a commercially sound condition with respect to decay.

In this test no substantial beneficial effect on the commodity was found which could be traced to the use of paper over the bulkheads or to ice under the floor racks, although ice under the floor racks hastened the cooling of the bottom crates.

Ice bruising of lettuce was greatly reduced by using sheets of paper between the layers of lettuce and the layers of package ice. Most benefit was obtained by using paper between the top layer of lettuce in the crate and the bulge ice.

The degree of discoloration of butts increased somewhat with increased time in transit, a slight change occurring between the 7th

and the 9th days following loading but there was no material increase between the 9th and the 12th days.

Lettuce adjacent to the top ice cooled rapidly to a temperature near to that of the top ice.

Most crates throughout the load along the centerline of cars cooled to 35° or lower by 3 A.M. on the day following loading.

In carrot cars whenever there was no space available for recess ice between the crate and the wall, commodity temperatures were 6° to 10° higher in wall-row crates than in centerline crates, but these relatively high wall-row temperatures, amounting in some instances to 44° at destination, were not deleterious to the carrots. High wall-row temperatures did not occur in the wide car, in which it was possible for more ice to come in contact with the crates.

The meltage of top ice was somewhat greater over the end stacks and near the doors than elsewhere in the cars. The use of block ice over the end stacks is suggested since it would provide the maximum quantity of ice at points where the greatest normal meltage occurs.

Lettuce adjacent to the top ice arrived frozen to some extent when the temperature of the top ice was 30° F. or colder (cars B, D, F, A, table 3). Carrot tops and roots did not freeze at temperatures similar to those that froze lettuce.

When received at the packinghouse, the 300-lb. blocks of ice were in some instances at a temperature of 20° F. Crushing and blowing operations warmed the ice only 2° or 3°.

The manufacture of ice with large open cores in the blocks such as were used in car P and the pulverizing of crushed ice prior to blowing it into cars are suggested as means of promoting more rapid warming of ice prior to its use in packages or for top icing.

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Shippers:

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Ralph E. Myers Co., Salinas, California
Bruce Church Co., Salinas, California
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Salinas Valley Vegetable Exchange, Salinas, California
J. H. Whitted, Salinas to New York for shippers
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LeRoy E. Weaver, Salinas to New York for shippers

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Inspection Agencies

Agricultural Marketing Service, U. S. Dept. Agr.
Railroad Perishable Inspection Agency, New York and Baltimore
Western Weighing and Inspection Bureau, Chicago

APPENDIX I.

Location of resistance thermometers in cars (tables 12 to 15, inclusive) and temperatures in transit.

Salinas, California, to Chicago, Illinois, Philadelphia, Pennsylvania, Baltimore, Maryland, and New York, New York.

August 18 to 30, 1939. Calif. 1939-3. PFE 197.

Observed by:

R. A. Doering, P.F.E.
W. R. Barger, U.S.D.A.

Table 12. Location of Resistance Thermometers

in cars A, B, C, D, E, F, G, H, and K

All crates loaded on side

Thermometer	Crate No.	Lettuce or ice	Position of crate in car /1	/2 Position in crate
1	1	Lettuce	Bottom layer Bunker stack	Center of bottom layer
2	2	Lettuce	Top layer Bunker stack	Center of bottom layer
3	2	Lettuce	Top layer Bunker stack	Edge of top layer nearest top ice
4		Ice	2" above thermometer 3	
5	3	Lettuce	Bottom layer Quarterlength stack	Center of bottom layer
6	4	Lettuce	Top layer Quarterlength stack	Center of bottom layer
7	4	Lettuce	Top layer Quarterlength stack	Edge of top layer nearest top ice
8		Ice	2" above thermometer 7	
9	5	Lettuce	Bottom layer Doorway stack	Center of bottom layer
10	6	Lettuce	Top layer Doorway stack	Center of bottom layer
11	6	Lettuce	Top layer Doorway stack	Edge of top layer nearest top ice
12		Ice	2" above thermometer 11	

/1 All crates along centerline of load.

/2 Refers to position as crate was packed. Since all these crates were loaded on their sides, the thermometers were in heads of lettuce about 9 inches above the floor racks in the bunker, quarterlength and doorway stacks, and in a similar position about 9 inches from the top of the load in these same stacks. Thermometers 3, 7, and 11 were inserted between the outer leaves of a head of lettuce in the bulge of the top crate, near the top ice. Ice temperatures were taken about 2 inches above these heads of lettuce.

Table 13. Location of Resistance Thermometers
in cars M, N, and P
Crates Containing Thermometers were Loaded Upright

Car	Thermo-meter	Crate No.	Lettuce or ice	Position of crates in car	Position in crate
All	1	2	Lettuce	Top crate Bunker stack	Center of top layer
All	2	2	Ice	Top crate Bunker stack	Center of bulge ice
All	3		Ice	2" above Bunker stack	
All	4	4	Lettuce	Top crate Quarterlength stack	Center of top layer
All	5	4	Ice	Top crate Quarterlength stack	Center of bulge ice
All	6		Ice	2" above Quarterlength stack	
M&P	7	6	Lettuce	Top crate Doorway stack	Center of top layer
N	7		Ice	2" above Doorway stack	
M&P	8	6	Ice	Top crate Doorway stack	Center of bulge ice
N	8	6	Lettuce	Top crate Doorway stack	Center of top layer
M&P	9		Ice	2" above Doorway stack	
N	9	6	Ice	Top crate Doorway stack	Center of bulge ice
All	10	6	Lettuce	Top crate Doorway stack	Center of 2nd layer
All	11	6	Ice	Top crate Doorway stack	Between top and 2nd layer
All	12	6	Lettuce	Top crate Doorway stack	Center of bottom layer

Table 14. Location of Resistance Thermometers

in Carrot Car R.

All crates loaded on side.
Bottoms of crates toward wall in outside rows.

Master Cable 37470

Thermometer	Crate No.	Bunch of ice	Position of crate in car			Position in crate
1		Bunch	North wall	Bottom crate	Bunker stack	Center of bottom layer
2		Bunch	North wall	3rd layer crate	Bunker stack	Bottom edge of bottom layer
3	2X	Bunch	South wall	Top crate	Bunker stack	Center of bottom layer
4		Ice	Centerline	2" above	Bunker stack	
5	3	Bunch	Centerline	Bottom crate	Quarterlength stack	Center of bottom layer
6	4	Bunch	Centerline	Top crate	Quarterlength stack	Center of bottom layer
7	4	Bunch	Centerline	Top crate	Quarterlength stack	Edge of top layer nearest top ice
8		Ice	Centerline	2" above	Quarterlength stack	
9	5	Bunch	Centerline	Bottom crate	Doorway stack	Center of bottom layer
10	6	Bunch	Centerline	Top crate	Doorway stack	Center of bottom layer
11	6	Bunch	Centerline	Top crate	Doorway stack	Edge of top layer nearest top ice
12		Ice	Centerline	2" above	Doorway stack	
			Master Cable 25			
1	1	Bunch	Centerline	Bottom crate	Bunker stack	Center of bottom layer
2	2	Bunch	Centerline	Top crate	Bunker stack	Center of bottom layer
3	2	Bunch	Centerline	Top crate	Bunker stack	Edge of top layer nearest top ice
4		Ice	South wall	2" above	Bunker stack	
5	3X	Bunch	South wall	Bottom crate	Quarterlength stack	Center of bottom layer
6	3Y	Bunch	South wall	3rd layer crate	Quarterlength stack	Bottom edge of bottom layer
7	4X	Bunch	South wall	Top crate	Quarterlength stack	Center of bottom layer
8		Ice	South wall	2" above	Quarterlength stack	
9	5X	Bunch	South wall	Bottom crate	Doorway stack	Center of bottom layer
10	5Y	Bunch	South wall	3rd layer crate	Doorway stack	Bottom edge of bottom layer
11	6X	Bunch	South wall	Top crate	Doorway stack	Center of bottom layer
12		Ice	South wall	2" above	Doorway stack	

Table 15. Location of Resistance Thermometers

in Carrot Cars S and T

All crates loaded on side. Bottoms of crates toward wall in outside rows.

Master Cables: Car S, 30354; Car T, 27.

Thermometers	Crate No.	Bunch or ice	Position of crates in car			Position in crate
1	1	Bunch	Centerline	Bottom crate	Bunker stack	Center of bottom layer
2	2	Bunch	Centerline	Top crate	Bunker stack	Center of bottom layer
3	2	Bunch	Centerline	Top crate	Bunker stack	Edge of top layer nearest top ice
4		Ice	Centerline	2" above	Bunker stack	
5	3	Bunch	Centerline	Bottom crate	Quarterlength stack	Center of bottom layer
6	4	Bunch	Centerline	Top crate	Quarterlength stack	Center of bottom layer
7	4	Bunch	Centerline	Top crate	Quarterlength stack	Edge of top layer nearest top ice
8		Ice	Centerline	2" above Quarterlength stack		
9	5	Bunch	Centerline	Bottom crate	Doorway stack	Center of bottom layer
10	6	Bunch	Centerline	Top crate	Doorway stack	Center of bottom layer
11	6	Bunch	Centerline	Top crate	Doorway stack	Edge of top layer nearest top ice
12		Ice	Centerline	2" above Doorway stack		
Master Cables: Car S, 59; Car T, 28.						
1	1X	Bunch	South wall	Bottom crate	Bunker stack	Center of bottom layer
2	1Y	Bunch	South wall	3rd layer crate	Bunker stack	Bottom edge of bottom layer
3	2X	Bunch	South wall	Top crate	Bunker stack	Center of bottom layer
4		Ice	South wall	2" above	Bunker stack	
5	3X	Bunch	South wall	Bottom crate	Quarterlength stack	Center of bottom layer
6	3Y	Bunch	South wall	3rd layer crate	Quarterlength stack	Bottom edge of bottom layer
7	4X	Bunch	South wall	Top crate	Quarterlength stack	Center of bottom layer
8		Ice	South wall	2" above Quarterlength stack		
9	5X	Bunch	South wall	Bottom crate	Doorway stack	Center of bottom layer
10	5Y	Bunch	South wall	3rd layer crate	Doorway stack	Bottom edge of bottom layer
11	6X	Bunch	South wall	Top crate	Doorway stack	Center of bottom layer
12		Ice	South wall	2" above	Doorway stack	

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 100187

Contents of Car Lettuce Test Calif.1939-3 PFE 197 Car C

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4 1/	5	6	7	8	9	10	11	12
Salinas, California	8/18	2:45P	63	41.5	53.5	45.8	32.0	59.2	54.5	49.5	55.0	60.5	63.2	60.3	64.8
" "	"	9:30P	58	33.3	38.9	34.2	34.3	37.9	39.3	34.6	31.3	37.6	36.3	35.4	30.8
Watsonville "	8/19	3:00A	55	32.7	35.2	32.6	33.9	34.4	35.8	33.2	31.3	34.4	34.0	33.2	31.3
San Jose "	"	5:45A	58	32.4	33.0	32.9	----	34.3	35.0	33.4	31.8	33.9	33.9	33.2	31.7
Roseville "	"	3:30P	101	32.1	32.0	32.3	35.9	33.0	33.5	32.4	31.7	32.8	32.9	32.4	31.4
Sparks, Nevada	8/20	3:15A	60	32.2	32.1	32.3	----	32.8	33.2	32.4	31.9	33.0	33.0	32.3	31.8
Red House "	"	2:20P	101	32.6	32.3	32.5	38.8	32.7	33.3	32.4	31.8	32.7	33.0	32.3	32.0
Carlin "	"	7:00P	72	32.2	32.1	32.3	37.3	32.6	33.0	32.4	32.0	32.2	33.0	32.3	31.8
Montello "	8/21	5:00A	58	32.4	32.6	32.6	37.2	32.9	32.9	32.3	32.2	32.4	33.5	33.2	32.3
Ogden, Utah	"	12:00N	90	32.2	32.3	32.3	35.1	32.9	32.9	32.7	31.9	32.7	33.1	32.4	32.1
Evanston, Wyoming	"	7:00P	77	32.3	32.6	32.4	39.9	32.9	32.8	32.3	31.9	32.6	33.3	32.9	32.2
Green River "	"	11:00P	64	32.4	32.5	32.8	33.0	33.2	32.8	32.6	31.7	32.7	33.0	32.8	32.2
Laramie "	8/22	10:15A	64	32.3	32.5	32.3	32.7	32.9	33.0	32.3	31.8	32.2	33.3	32.4	32.7
Cheyenne "	"	4:00P	82	31.9	32.2	32.3	31.9	32.4	32.7	32.2	31.8	32.1	33.0	32.6	32.3
North Platte, Nebraska	8/23	12:30A	52	31.8	32.3	32.9	32.2	32.4	33.0	32.4	31.9	32.6	33.2	33.0	33.3
Grand Island "	"	9:00A	72	32.2	32.3	32.3	32.1	32.7	32.8	32.3	31.8	32.7	32.9	32.8	33.1
Council Bluffs, Iowa	"	3:40P	91	32.2	32.4	32.5	32.5	32.4	33.1	32.4	32.0	32.6	33.0	32.9	32.4
" "	"	8:00P	82	32.3	32.6	32.8	33.0	33.0	32.9	32.7	32.1	32.8	33.5	34.4	32.6
Boone "	8/24	3:15A	56	32.2	32.3	32.6	32.9	32.4	33.1	32.4	31.8	32.9	33.9	32.7	32.5
Clinton "	"	10:30A	77	32.5	32.8	32.8	32.8	32.7	33.5	32.4	31.9	33.2	33.0	32.8	32.3
Proviso, Illinois	"	7:00P	77	32.1	32.3	32.4	34.5	32.8	33.3	32.4	31.8	32.6	33.2	33.4	32.6
Chicago "	8/25	3:30A	58	32.1	32.3	32.1	32.8	31.8	32.7	31.8	31.4	32.4	32.0	32.7	31.7

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

1/ High readings due to faulty electric contact when temperatures were taken.

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) August 1939 — Car initial and No. PFE 95655

Contents of Car Lettuce — Test Calif. 1939-3 P F E 197 — Car A

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, California	8/18	10:10A	66	52.1	52.4	47.3	40.9	55.0	39.7	37.3	48.3	51.4	46.7	54.0	57.2
" "	"	3:00P	63	41.5	41.3	40.6	47.7	41.4	45.0	38.3	41.8	39.7	40.2	39.3	44.7
" "	"	5:00P	58	38.5	34.0	36.6	30.0	38.7	33.5	32.8	30.3	37.2	38.2	36.3	31.8
" "	"	9:30P	58	34.3	35.0	32.7	29.8	34.3	31.7	31.0	29.6	32.9	34.2	32.4	31.0
Watsonville "	8/19	2:00A	55	32.7	33.5	31.9	29.9	32.4	30.5	30.3	29.8	31.9	33.1	31.8	31.1
San Jose "	"	5:45A	58	32.6	33.4	32.4	30.0	31.9	30.5	30.6	29.9	31.8	33.0	31.6	31.2
Roseville "	"	3:30P	101	32.0	32.0	31.5	29.8	31.4	30.2	30.1	30.1	30.8	32.3	31.1	31.2
Sparks, Nevada	8/20	3:15A	60	32.7	32.4	32.0	30.0	31.5	30.1	30.4	30.1	31.3	32.4	32.2	31.5
Red House "	"	2:20P	101	31.6	32.2	32.0	30.1	31.4	30.2	30.4	30.1	31.3	32.4	31.6	31.6
Carlin "	"	7:00P	72	31.7	32.0	31.0	30.4	31.4	30.1	30.1	30.1	30.9	32.4	31.8	31.5
Montello "	8/21	5:00A	54	32.0	32.1	32.1	31.1	31.6	31.6	30.4	30.6	31.6	32.5	32.2	32.7
Ogden, Utah	"	12:00N	90	31.7	32.2	31.8	30.4	31.6	30.5	30.4	32.1	31.0	32.2	31.3	31.6
Evanston, Wyoming	"	7:00P	77	32.2	32.5	32.0	30.6	31.5	30.3	30.3	30.1	31.1	32.8	31.4	31.6
Green River "	"	11:00P	64	32.1	32.4	32.5	30.6	31.1	30.1	31.0	31.1	31.0	32.9	33.8	31.7
Laramie "	8/22	10:15A	64	31.7	32.5	32.8	32.0	32.1	30.6	30.1	30.4	31.9	33.4	33.5	32.2
Cheyenne "	"	4:00P	82	32.5	32.5	31.9	30.5	31.6	30.1	30.9	30.9	31.3	32.6	33.7	32.2
North Platte, Nebraska	8/23	12:30A	52	32.3	32.6	32.8	30.7	31.6	30.1	30.2	30.1	31.5	33.4	34.5	32.6
Grand Island "	"	9:00A	72	32.0	32.1	31.9	30.4	31.7	30.4	30.1	30.1	32.0	32.5	31.2	31.6
Council Bluffs, Iowa	"	3:40P	91	31.7	32.4	32.2	30.7	31.8	30.1	30.1	30.1	30.8	32.0	31.6	31.6
" "	"	8:00P	82	31.8	32.3	32.1	31.6	31.7	30.4	30.7	30.2	31.2	33.3	32.7	31.8
Boone "	8/24	3:15A	56	32.8	32.9	32.0	31.0	31.5	30.3	30.2	30.1	31.7	32.4	----	31.7
Clinton "	"	10:30A	77	32.1	32.6	32.2	30.9	31.6	30.6	30.2	30.5	31.4	33.1	----	32.0
Proviso, Illinois	"	7:00P	77	31.6	32.1	32.5	30.5	31.0	30.0	30.2	30.4	31.1	33.6	----	31.9
Blue Island "	8/25	2:15A	64	31.3	32.0	32.4	30.7	31.3	30.1	30.2	30.1	30.8	32.1	31.5	31.9
Dolton "	"	7:30A	72	31.8	32.2	32.2	30.7	31.4	30.3	30.3	30.1	31.7	33.0	----	31.8
Logansport, Indiana	"	11:45A	82	31.7	32.2	31.8	30.5	31.4	30.1	30.4	30.1	30.6	32.1	31.2	31.5
Columbus, Ohio	"	6:45P	76	31.6	31.9	32.1	31.2	31.7	30.5	30.3	30.4	30.9	----	31.5	31.7
Pitcairn, Pennsylvania	8/26	4:00A	60	31.7	32.1	31.9	30.8	31.4	30.1	30.4	30.3	30.6	32.1	31.6	32.1
Altoona "	"	9:10A	68	31.8	32.1	33.3	30.8	31.3	30.2	30.2	30.4	31.0	32.9	31.7	32.4
Enola "	"	1:45P	84	31.8	31.8	32.0	30.7	31.4	30.5	30.3	30.3	30.7	32.0	31.8	31.9
Harismus Cove, N. J.	8/27	2:30A	68	31.6	32.1	32.2	30.5	31.5	30.5	31.0	30.1	31.3	32.2	32.5	32.2
New York City	"	7:00P	75	31.5	31.9	32.0	30.8	31.3	31.4	30.3	30.5	32.3	33.1	----	31.7

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry

Fruit and Vegetable Transportation Investigations — Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) August 1939 Car initial and No. PFE 95740

Contents of Car Lettuce Test Calif. 1939-3 PFE 197 Car B

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, California	8/18	1:10P	66	45.1	44.9	50.1	55.7	58.2	51.3	52.4	52.2	64.0	55.8	62.0	58.9
" "	"	3:00P	63	41.5	42.0	41.4	32.2	49.0	44.7	42.8	31.8	52.0	48.8	43.0	32.5
" "	"	9:30P	58	35.1	34.8	33.6	32.2	36.4	35.8	33.9	31.5	36.9	37.1	33.9	31.9
Watsonville "	8/19	3:00A	55	33.9	33.4	32.9	32.3	34.7	34.0	33.0	31.7	34.4	34.6	33.1	32.2
San Jose "	"	5:45A	58	33.5	32.8	32.3	32.2	33.9	35.1	32.9	31.8	33.8	34.0	32.9	32.2
Roseville "	"	3:30P	101	32.6	32.3	32.3	32.1	32.8	34.7	32.4	31.7	32.8	33.0	32.0	32.2
Sparks, Nevada	8/20	3:15A	60	32.2	31.8	32.0	31.8	32.3	34.1	32.4	31.8	32.2	32.6	32.2	31.8
Red House "	"	2:20P	101	32.2	31.9	32.1	32.0	32.4	33.4	32.9	31.9	32.4	32.5	31.1	32.0
Carlin "	"	7:00P	72	32.1	31.8	32.0	32.0	32.3	32.9	32.9	31.8	32.1	32.6	31.2	32.1
Montello "	8/21	5:00A	58	32.5	32.2	32.3	31.9	32.6	33.4	33.1	31.8	32.5	32.5	31.4	31.9
Ogden, Utah	"	12:00N	90	32.1	32.2	32.0	31.8	32.2	32.9	32.8	32.1	32.6	32.7	29.9	31.9
Evanston, Wyoming	"	7:00P	77	32.5	32.3	32.3	32.3	32.8	33.3	32.9	32.1	32.4	32.9	28.5	32.1
Green River "	"	11:00P	64	32.1	32.5	32.2	32.4	32.5	33.9	32.8	32.0	32.4	32.7	----	32.0
Laramie "	8/22	10:15A	64	32.5	31.9	32.4	32.1	32.2	32.8	32.6	31.8	32.3	33.2	----	30.9
Cheyenne "	"	4:00P	82	32.2	31.7	32.4	32.2	32.5	34.5	32.8	31.6	32.2	33.0	31.3	31.9
North Platte, Nebrasks	8/23	12:30A	52	32.1	32.0	32.1	31.8	32.2	34.2	32.3	31.7	32.2	32.7	31.3	31.9
Grand Island "	"	9:00A	72	32.2	31.9	31.9	31.9	32.3	34.3	32.4	31.7	32.2	32.6	31.3	32.3
Council Bluffs, Iowa	"	3:40P	91	32.1	31.9	32.3	32.3	32.4	33.8	32.4	31.8	32.5	32.8	29.7	32.3
" "	"	8:00P	82	32.4	32.3	32.5	32.4	32.6	33.3	32.8	32.1	32.6	33.4	32.8	31.8
Boone "	8/24	3:15A	56	32.3	31.8	32.3	32.2	32.4	33.2	32.4	31.8	32.2	33.0	30.6	31.9
Clinton "	"	10:30A	77	32.2	32.0	32.0	32.3	32.3	33.4	32.4	31.9	32.2	33.0	28.7	32.2
Proviso, Illinois	"	7:00P	77	32.4	31.9	32.3	32.3	32.0	33.4	32.4	31.9	32.2	33.0	28.8	32.1
Chicago "	8/25	3:30A	58	31.7	31.9	31.5	32.2	31.8	33.3	31.8	31.2	31.8	31.9	28.8	31.9

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 95054

Contents of Car Lettuce Test Calif.1939-3 P F E 197 Car D

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	10:35A	62	52.1	53.2	54.6	54.7	54.9	57.8	56.4	55.9	56.5	53.0	51.9	54.9
" "	"	11:45A	73	48.1	51.3	49.1	33.8	52.7	55.8	49.3	33.2	53.5	50.0	46.6	33.3
" "	"	4:00P	60	38.6	39.8	34.8	32.7	41.2	41.2	34.6	32.3	40.3	37.4	34.0	31.4
" "	"	9:30P	58	35.4	35.6	33.2	32.0	37.4	35.9	33.3	32.0	35.3	33.6	32.5	31.6
Watsonville "	8/19	3:00A	55	35.2	33.8	32.6	31.9	34.4	34.4	33.0	32.0	34.1	32.9	32.2	31.7
San Jose "	"	5:45A	58	34.3	33.3	32.4	31.6	33.6	34.2	32.9	32.0	33.1	32.3	31.9	31.4
Roseville "	"	3:30P	101	33.1	32.7	31.9	31.7	32.6	33.2	32.5	31.8	32.6	32.0	32.0	31.7
Sparks, Nevada	8/20	3:15A	60	32.2	32.3	32.1	30.5	33.6	33.1	32.6	31.8	32.5	32.3	32.0	31.5
Red House "	"	2:20P	101	32.3	32.6	32.5	30.9	33.9	33.1	32.7	31.9	32.6	32.3	32.2	31.7
Carlin "	"	7:00P	72	31.9	32.1	32.0	31.1	33.7	32.8	32.6	31.7	32.2	32.6	31.7	31.5
Montello "	8/21	5:00A	58	32.2	32.3	32.4	31.2	34.0	33.3	32.8	32.0	32.6	32.3	32.1	31.9
Ogden, Utah	"	12:00N	90	32.3	32.5	32.4	31.4	35.0	33.6	32.6	32.0	32.6	32.7	32.4	32.2
Evanston, Wyoming	"	7:00P	77	32.5	32.7	32.5	31.3	34.7	33.6	32.7	32.3	32.6	33.0	32.4	31.8
Green River "	"	11:00P	64	32.2	32.5	32.5	31.0	----	33.3	32.6	31.6	32.5	32.9	32.7	31.9
Laramie "	8/22	10:15A	64	32.2	32.2	32.4	32.1	35.8	33.2	32.6	32.4	32.2	32.8	32.4	32.3
Cheyenne "	"	4:00P	82	32.3	32.6	32.6	32.1	34.9	33.2	32.6	32.0	32.4	32.9	32.1	32.3
North Platte, Nebraska	8/23	12:30A	52	31.9	32.3	32.3	32.1	33.6	33.0	32.6	31.8	32.3	32.1	31.9	32.2
Grand Island, Nebraska	"	9:00A	72	32.0	32.4	32.3	32.1	34.6	33.1	32.9	32.0	32.6	32.3	32.1	32.5
Council Bluffs, Iowa	"	3:40P	91	32.3	32.6	32.4	32.1	33.0	32.9	33.0	32.3	32.5	32.8	32.1	32.1
" "	"	8:00P	82	32.1	32.6	32.5	32.8	35.0	33.1	32.9	32.4	32.3	32.3	33.7	32.3
Boone "	8/24	3:15A	56	31.8	32.2	32.2	32.0	33.7	32.8	32.9	32.4	32.3	34.8	32.0	32.0
Clinton "	"	10:30A	77	32.2	32.5	32.4	32.0	32.4	32.9	32.9	32.3	32.3	31.9	31.7	31.8
Proviso, Illinois	"	7:00P	77	31.9	32.2	32.0	32.1	32.2	32.8	32.6	32.5	32.2	32.7	32.0	32.2
Blue Island "	8/25	2:15A	64	31.8	32.1	32.0	32.4	32.2	32.7	32.6	32.4	32.3	31.9	31.7	31.8
Dolton "	"	7:30A	72	32.0	32.4	32.0	32.1	32.2	32.8	32.7	32.5	32.3	32.2	31.9	31.8
Logansport, Indiana	"	11:45A	82	31.8	32.3	32.0	32.1	32.6	33.2	33.1	32.5	32.3	32.3	31.7	32.2
Columbus, Ohio	"	6:45P	76	31.9	32.2	32.6	32.1	32.3	32.0	33.3	32.8	32.6	32.9	34.0	32.3
Pitcairn, Pennsylvania	8/26	4:00A	60	32.3	32.6	32.1	32.0	32.3	28.8	33.1	32.6	31.9	32.2	32.2	32.3
Altoona "	"	9:15A	68	32.0	32.4	32.6	32.1	32.1	30.1	33.5	32.5	32.3	33.3	33.3	32.8
Enola "	"	1:45P	84	32.2	32.3	32.4	32.0	32.2	30.7	33.0	32.5	32.2	32.1	32.1	32.2
Baltimore, Maryland	8/28	4:30P	75	32.3	32.4	32.3	35.1	32.1	32.3	34.0	32.8	32.6	32.6	32.5	32.5
" "	8/29	11:00A	79	32.5	33.2	33.2	33.3	33.0	32.3	34.4	34.5	33.6	33.1	32.7	32.4

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 95741

Contents of Car Lettuce Test Calif.1939-3 PFE 197 Car E

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	10:15A	62	46.7	42.5	53.5	44.9	53.3	34.8	52.4	53.4	49.2	56.1	49.1	44.1
" "	"	10:30A	62	46.0	41.5	53.0	42.5	52.2	32.7	46.0	51.8	48.4	53.8	42.9	32.0
" "	"	11:30A	73	45.2	45.1	49.5	44.0	49.8	34.2	45.3	49.4	47.3	49.5	40.3	31.9
" "	"	4:00P	60	37.0	36.6	33.0	32.8	37.2	32.3	35.7	36.8	37.2	37.6	33.1	31.0
" "	"	9:30P	58	35.1	35.4	31.6	32.5	34.1	32.5	34.5	33.8	33.9	34.7	31.4	31.1
Watsonville "	8/19	3:00A	55	34.3	33.1	32.9	32.3	33.0	32.5	34.2	32.6	33.1	33.8	31.2	31.4
San Jose "	"	5:45A	58	34.2	33.5	32.3	32.6	31.7	31.8	34.1	32.6	32.7	33.6	31.2	31.4
Roseville "	"	3:30P	101	33.8	----	32.5	32.6	31.7	31.6	33.8	32.6	32.0	32.7	31.1	31.1
Sparks, Nevada	8/20	3:15A	60	33.8	----	32.5	32.3	31.8	31.8	33.9	33.0	32.4	32.2	31.5	31.5
Red House "	"	2:20P	101	33.8	----	32.5	32.7	31.9	32.0	33.7	33.3	32.4	32.4	31.2	31.7
Carlin "	"	7:00P	72	33.8	----	32.5	32.7	31.9	31.8	33.5	32.9	32.2	32.2	30.8	31.6
Montello "	8/21	5:00A	58	33.7	----	32.6	32.4	32.4	32.5	33.9	33.2	32.4	32.4	31.3	32.0
Ogden, Utah	"	12:00N	90	33.9	----	32.6	32.7	32.0	32.1	33.3	32.8	33.4	32.6	31.1	32.0
Evanston, Wyoming	"	7:00P	77	33.9	----	32.6	33.2	32.3	32.2	33.5	32.9	33.7	32.6	32.1	32.0
Green River "	"	11:00P	64	33.9	----	32.8	32.8	32.0	31.6	33.5	32.9	35.2	32.5	31.6	31.9
Laramie "	8/22	10:15A	64	33.9	----	32.8	32.8	32.6	32.6	33.1	32.0	33.8	32.6	31.3	32.2
Cheyenne "	"	4:00P	82	33.8	----	33.1	32.8	32.7	32.7	33.3	32.0	34.2	32.6	31.6	32.2
North Platte, Nebraska	8/23	12:30A	52	33.7	----	32.5	32.2	32.3	32.3	32.8	31.9	33.8	32.1	31.2	31.7
Grand Island "	"	9:00A	72	33.9	----	32.6	32.4	32.4	32.7	33.2	32.0	33.8	32.3	31.2	32.1
Council Bluffs, Iowa	"	3:40P	91	33.8	33.1	32.6	32.7	32.6	32.4	33.0	32.1	35.8	32.5	31.2	32.0
" "	"	8:00P	82	33.7	33.1	33.0	32.8	32.5	32.6	33.4	32.0	37.3	33.0	32.9	32.2
Boone "	8/24	3:15A	56	33.6	33.1	32.7	32.3	32.5	32.7	33.3	32.0	34.5	32.5	32.5	31.8
Clinton "	"	10:30A	77	33.9	32.6	32.5	32.6	32.5	32.7	33.1	31.8	35.2	32.1	31.0	31.7
Proviso, Illinois	"	7:00P	77	33.5	34.2	32.5	32.3	32.3	32.5	33.1	31.7	34.7	32.5	31.2	32.0
Blue Island "	8/25	2:15A	64	33.7	35.1	32.7	32.8	32.5	32.9	33.4	31.9	37.1	32.1	31.1	32.2
Dolton "	"	7:30A	72	33.3	36.2	32.5	32.0	32.2	32.5	33.5	31.8	42.1	31.8	30.9	31.8
Logansport, Indiana	"	11:45A	82	33.7	----	32.5	32.6	32.4	32.8	33.3	32.0	39.2	32.1	31.2	32.0
Columbus, Ohio	"	6:45P	76	33.4	----	32.9	32.4	32.3	32.9	33.5	32.4	35.4	35.5	32.6	32.4
Pitcairn, Pennsylvania	8/26	4:00A	60	33.2	----	32.7	32.3	32.8	32.8	33.4	32.0	32.7	32.2	31.1	32.6
Altoona "	"	9:10A	68	32.6	----	32.8	32.3	32.3	32.6	33.7	32.1	33.4	32.8	31.7	32.1
Enola "	"	1:45P	84	33.7	33.2	32.6	32.2	32.7	33.1	33.4	32.0	32.3	32.1	31.5	32.1
Philadelphia "	8/27	8:00P		32.2	----	33.5	31.7	31.7	32.2	33.2	31.3	33.5	31.3	30.7	31.3
" "	8/30	9:30A		32.5	----	32.9	32.0	31.8	33.0	33.7	31.8	34.2	31.5	31.1	31.4

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 100167

Contents of Car Lettuce Test ~~Sept.~~ Aug. 1939-3 PFE 197 Car F

Place (Town and State)	Day of Month	Time	Outside Temp.	1	22	3	4	5	6	7	8	9	10	11	12
Salinas, California	8/18	1:15P	66	54.1	56.3	56.8	51.7	59.2	60.0	50.8	52.4	61.2	61.1	52.5	59.0
" "	"	2:30P	63	48.8	47.2	44.0	31.8	51.0	52.0	38.5	31.7	52.1	51.2	43.0	32.5
" "	"	9:30P	58	36.8	35.0	33.5	31.5	36.0	36.3	32.8	31.5	37.3	36.0	33.8	31.7
Watsonville "	8/19	3:00A	55	34.2	33.4	32.6	31.8	33.8	34.0	32.1	31.5	34.5	34.1	32.7	31.5
San Jose "	"	5:45A	58	33.6	33.5	32.6	32.0	33.2	33.9	32.0	31.5	33.9	33.7	32.5	31.7
Roseville "	"	3:30P	101	32.8	32.7	32.2	31.7	32.2	33.0	32.1	31.4	33.0	32.7	32.3	31.7
Sparks, Nevada	8/20	3:15A	60	32.2	32.7	31.9	31.6	31.7	32.6	31.7	30.8	33.0	32.6	32.0	31.6
Red House "	"	2:20P	101	32.6	32.7	32.3	31.8	31.8	32.6	31.9	31.2	33.0	32.8	32.2	31.6
Carlin "	"	7:00P	72	32.5	32.6	32.0	31.7	31.8	32.5	31.7	31.1	32.8	32.9	32.1	31.7
Montello "	8/21	5:00A	58	32.4	32.6	32.2	31.8	31.8	32.8	31.6	31.2	32.9	32.9	32.0	31.9
Ogden, Utah	"	12:00N	90	32.2	32.4	31.8	31.4	31.4	32.4	31.2	31.2	32.5	32.7	31.9	31.5
Evanston, Wyoming	"	7:00P	77	32.7	32.8	32.2	31.9	32.2	33.0	31.6	31.8	32.9	33.0	32.8	31.6
Green River "	"	11:00P	64	32.6	33.0	32.3	32.8	32.2	32.8	31.9	31.6	32.6	33.2	32.4	31.9
Laramie "	8/22	10:15A	64	31.8	32.6	32.3	31.8	31.9	32.4	31.7	31.9	32.7	33.0	32.4	31.8
Cheyenne "	"	4:00P	82	32.1	32.7	32.3	31.8	31.8	32.6	32.0	31.7	32.6	32.9	31.9	31.8
North Platte, Nebraska	8/23	12:30A	52	32.6	33.0	32.5	31.4	31.8	32.5	31.7	32.2	32.6	32.7	32.0	32.0
Grand Island "	"	9:00A	72	32.4	32.7	32.3	31.8	32.3	32.6	32.0	31.8	32.6	32.8	32.4	32.5
Council Bluffs, Iowa	"	3:40P	91	32.5	33.0	32.4	31.7	32.3	32.9	32.5	32.0	32.8	32.8	32.5	32.0
" "	"	8:00P	82	32.4	32.7	32.2	31.9	32.7	33.7	32.4	32.1	32.9	33.0	33.0	32.1
Boone "	8/24	3:15A	56	32.3	32.6	32.1	31.7	32.2	32.5	32.6	32.0	32.6	33.1	32.5	32.0
Clinton "	"	10:30A	77	32.5	32.7	32.2	31.8	31.9	32.6	32.5	32.0	32.5	32.6	32.0	31.6
Proviso, Illinois	"	7:00P	77	32.1	32.7	32.3	32.1	32.0	32.5	32.5	31.7	32.5	32.5	32.0	31.7
Blue Island "	8/25	2:15A	64	32.2	32.9	31.9	31.5	32.1	32.6	32.3	32.1	32.6	32.6	32.0	32.0
Dolton "	"	7:30A	72	32.3	32.8	32.0	31.5	32.0	34.7	32.3	31.9	32.7	33.0	32.4	31.6
Logansport, Indiana	"	11:45A	82	32.0	33.1	32.3	31.6	31.9	34.6	32.2	32.1	32.6	33.1	32.0	32.0
Columbus, Ohio	"	6:45P	76	32.1	32.9	31.8	31.4	32.4	35.5	33.1	32.2	32.9	33.7	33.2	31.9
Pitcairn, Pennsylvania	8/26	4:00A	60	32.5	32.9	32.1	31.3	32.1	34.1	31.7	32.2	32.6	32.9	32.6	32.1
Altoona, "	"	9:10A	68	32.2	32.7	32.2	31.3	32.2	34.6	32.2	32.1	32.7	33.9	32.2	33.0
Enola "	"	1:45P	84	32.2	32.9	31.9	31.2	32.0	34.5	32.1	32.2	32.5	33.0	32.3	31.7
Philadelphia "	8/27	8:00P		31.8	32.5	31.2	31.5	31.2	31.4	31.3	31.4	32.0	32.1	31.5	31.4

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939

Car initial and No. PFE 94659

Contents of Car: Lettuce Test: Calif.1939-3 PFE 197 Car G

Place (Town and State)	Day of Month	Time	Outside Temp.	1/ 1	2	3	4	5	6	7	8	9	10	11	12
Salinas, California	8/18	3:30P	63	50.4	52.3	52.5	53.3	53.2	54.9	51.3	58.0	67.0	58.4	63.4	50.3
" "	"	5:00P	60	47.3	46.8	46.5	31.0	45.6	47.4	38.3	33.0	57.8	49.2	52.7	34.3
" "	"	9:30P	58	39.2	36.0	38.6	31.1	37.2	38.9	32.8	31.4	41.3	37.3	37.3	33.5
Watsonville "	8/19	3:00A	55	37.1	33.7	33.2	31.6	37.3	34.0	32.7	32.2	35.7	32.3	33.8	32.1
San Jose "	"	5:45A	59	36.3	33.0	32.6	31.4	36.1	33.4	32.4	31.8	33.8	32.4	32.6	32.3
Roseville "	"	3:30P	101	35.2	32.6	32.2	31.4	34.4	32.9	32.3	31.8	32.6	32.0	32.3	31.3
Sparks, Nevada	8/20	3:15A	60	36.5	31.7	32.1	30.2	33.9	32.6	32.2	31.7	32.1	31.5	32.3	31.1
Red House "	"	2:20P	101	36.2	32.7	32.2	31.6	34.0	32.8	32.3	32.1	32.2	31.6	32.2	31.4
Carlin, "	"	7:00P	72	35.3	32.3	32.0	31.3	33.8	32.7	32.2	31.8	32.2	31.7	32.0	31.1
Montello "	8/21	5:00A	58	35.5	32.3	32.2	31.3	31.9	32.6	32.3	31.8	31.9	31.9	32.3	31.3
Ogden, Utah	"	12:00N	90	37.9	32.5	32.1	31.8	31.7	32.8	32.3	31.9	32.2	31.7	32.2	31.3
Evanston, Wyoming	"	7:00P	77	39.6	32.7	32.2	31.8	34.0	32.4	31.9	32.0	32.1	31.8	33.1	31.4
Green River "	"	11:00P	64	40.5	32.4	32.6	32.2	32.0	32.5	31.9	31.8	32.3	31.8	33.2	31.4
Laramie "	8/22	10:15A	64	40.1	32.6	31.8	31.8	33.9	32.3	32.2	31.9	32.1	32.9	32.3	31.4
Cheyenne "	"	4:00P	82	----	32.2	31.9	32.2	33.6	32.6	31.8	31.8	32.2	32.5	32.3	32.0
North Platte, Nebrasks	8/23	12:30A	52	----	32.1	32.0	31.7	33.6	32.6	32.1	31.8	32.1	31.8	32.8	31.8
Grand Island "	"	9:00A	72	----	32.1	32.1	31.7	34.1	32.7	32.2	31.9	32.2	32.0	32.0	31.5
Council Bluffs, Iowa	"	3:40P	91	----	32.3	32.2	32.1	34.1	32.8	32.3	31.9	32.2	32.3	32.3	31.8
" "	"	8:00P	82	----	32.4	32.2	32.3	34.8	32.8	32.3	31.9	32.2	33.0	33.7	32.0
Boone "	8/24	3:15A	56	34.4	32.2	32.2	31.8	34.1	33.1	31.9	32.3	32.2	31.9	32.0	31.7
Clinton "	"	10:30A	77	33.8	32.1	32.0	31.8	33.8	32.7	32.1	31.8	31.9	31.8	31.9	31.8
Proviso, Illinois	"	7:00P	77	34.7	32.1	32.0	31.8	33.5	32.6	31.8	31.9	31.9	31.5	31.8	32.0
Chicago "	8/25	3:30A	58	34.2	31.5	31.7	31.9	33.3	32.0	31.7	32.5	31.7	31.0	32.1	31.6

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry

Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

1/ Thermometer apparently defective.

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) August 1939 Car initial and No. PFE 95739

Contents of Car Lettuce Test Calif.1939-3 P F E 197 Car H

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, California	8/18	9:00A	63	36.5	41.9	54.1	34.9	38.4	43.8	39.1	32.6	41.6	59.2	51.3	51.7
" "	"	10:00A	60	36.0	40.6	50.0	29.5	37.4	40.7	38.8	31.5	41.2	52.2	40.3	47.7
" "	"	4:00P	60	32.3	34.6	35.6	30.5	33.3	32.8	33.8	30.8	34.0	34.4	31.7	34.7
" "	"	9:30P	58	31.7	33.0	33.3	30.4	32.4	31.9	32.6	31.3	32.6	32.5	31.7	32.4
Watsonville "	8/19	3:00A	55	31.3	32.3	32.4	30.6	32.4	31.9	32.1	31.1	32.0	31.7	31.6	31.5
San Jose "	"	5:45A	59	31.1	31.7	32.0	30.8	32.2	31.7	32.0	31.0	31.9	31.6	31.6	31.1
Roseville "	"	3:30P	101	31.1	31.6	31.9	30.8	31.8	31.7	31.8	30.3	31.6	31.6	31.5	31.5
Sparks, Nevada	8/20	3:30A	60	30.7	31.3	31.7	31.5	31.9	31.4	31.6	30.9	31.6	31.5	32.0	31.5
Red House "	"	2:20P	101	30.8	31.6	31.8	30.8	31.8	31.5	31.7	30.9	31.5	31.6	31.9	33.5
Carlin "	"	7:00P	72	30.8	31.2	31.6	30.9	31.4	31.3	31.7	31.1	31.5	31.6	31.8	32.8
Montello "	8/21	5:00A	58	31.1	31.6	31.8	30.9	31.8	31.1	32.0	31.1	31.9	31.5	32.1	35.9
Ogden Utah	"	12:00N	90	30.9	31.2	31.9	31.1	31.5	31.0	32.5	31.1	32.0	31.5	32.1	----
Evanston, Wyoming	"	7:00P	77	31.0	31.6	31.9	31.5	32.0	31.4	33.0	31.8	31.7	31.8	33.1	----
Green River "	"	11:00P	64	31.0	31.5	31.9	31.3	32.3	31.0	32.4	31.4	31.9	31.9	33.1	----
Laramie "	8/22	10:15A	64	31.1	31.6	31.8	31.3	31.8	31.3	32.0	31.0	31.5	31.6	32.0	----
Cheyenne "	"	4:00P	82	31.0	31.3	31.8	31.3	31.5	31.7	31.9	31.0	31.5	31.6	32.6	----
North Platte, Nebraska	8/23	12:30A	52	30.7	31.2	31.5	31.2	31.3	31.3	31.7	31.0	30.8	31.4	31.9	----
Grand Island "	"	9:00A	72	30.9	31.3	31.8	31.3	31.4	31.4	31.8	31.2	31.4	29.9	32.5	----
Council Bluffs, Iowa	"	3:40P	91	31.1	31.6	31.8	31.5	31.3	31.4	31.8	31.4	31.1	31.6	32.2	35.2
" "	"	8:00P	82	31.0	31.3	31.9	31.9	31.7	31.3	31.7	31.3	31.1	32.9	34.6	----
Boone "	8/24	3:15A	56	30.8	31.6	31.8	31.4	31.4	31.4	31.6	30.8	31.3	31.6	32.3	----
Clinton "	"	10:30A	77	30.7	31.2	31.5	31.3	31.0	31.4	31.6	31.0	31.1	31.5	31.9	----
Proviso, Illinois	"	7:00P	77	30.7	31.3	31.4	31.4	31.1	31.3	31.7	30.8	31.5	31.4	30.7	----
Blue Island "	8/25	2:15A	64	30.6	31.2	31.6	31.3	31.4	31.9	31.5	30.9	31.5	31.5	32.2	----
Dolton "	"	7:30A	72	30.8	31.2	31.4	31.4	31.1	31.1	31.3	30.9	31.2	31.5	32.0	----
Logansport, Indiana	"	11:45A	82	31.0	31.2	31.4	31.4	31.4	30.2	31.5	30.9	31.1	31.5	32.1	----
Columbus, Ohio	"	6:45P	76	30.5	31.3	31.8	31.6	31.4	31.5	31.6	31.0	31.1	33.3	32.7	----
Pitcairn, Pennsylvania	8/26	4:00A	60	31.1	31.5	31.9	31.8	31.8	31.4	31.6	30.9	31.1	32.5	33.6	----
Altoona "	"	9:10A	68	30.8	30.9	31.5	31.9	31.4	31.3	31.4	31.0	31.3	32.0	35.2	----
Enola "	"	1:45P	84	30.6	31.0	31.1	32.1	31.2	31.2	31.5	30.8	31.2	31.8	34.1	----
Harismus Cove, N. J.	8/27	2:30A	68	30.6	30.7	31.2	32.3	31.2	30.9	31.1	30.5	30.8	33.0	31.6	35.6
New York City	"	7:00P	75	30.6	30.8	31.3	33.4	32.7	31.9	31.9	30.9	31.8	----	32.0	35.9

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry

Fruit and Vegetable Transportation Investigations Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 100303

Contents of Car Lettuce Test Calif. 1939-3 P F E 197 Car K

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, California	8/18	11:30A	77	38.5	42.0	41.1	30.6	37.3	40.5	57.3	53.3	59.0	55.9	57.9	49.3
" "	"	4:00P	60	34.1	37.1	37.6	31.6	35.5	37.3	40.7	31.5	42.5	37.0	38.2	31.1
" "	"	9:30P	58	32.2	34.4	33.4	30.8	33.2	37.2	35.4	31.3	36.2	33.4	33.1	31.1
Watsonville "	8/19	2:00A	55	31.8	33.3	32.3	30.9	32.3	32.8	33.2	31.3	33.8	32.5	31.9	31.0
San Jose "	"	5:45A	58	32.1	33.7	32.3	31.6	32.8	33.2	33.6	31.9	33.7	32.7	32.0	31.7
Roseville "	"	3:30P	101	32.0	33.4	32.0	31.5	32.6	32.8	32.7	32.1	32.9	32.4	32.0	31.7
Sparks, Nevada	8/20	3:15A	60	32.0	33.3	31.8	31.8	32.3	32.6	32.7	32.2	32.9	32.4	32.0	31.6
Red House "	"	2:20P	101	32.1	----	31.8	31.7	32.3	33.3	32.7	32.2	32.9	32.3	32.1	31.8
Carlin "	"	7:00P	72	32.1	----	31.8	32.2	32.4	32.4	32.7	31.9	32.5	32.2	32.3	31.7
Montello "	8/21	5:00A	58	32.2	----	32.2	32.3	32.6	32.5	33.0	32.3	32.7	32.4	32.8	31.7
Ogden, Utah	"	12:00N	90	32.1	----	32.0	32.0	32.5	32.7	32.7	32.2	32.9	32.4	32.5	31.9
Evanston, Wyoming	"	7:00P	77	32.4	----	32.3	32.6	33.2	32.7	33.1	32.2	32.9	32.7	33.5	32.3
Green River "	"	11:00P	64	32.6	----	32.5	32.5	32.8	32.7	32.7	32.1	32.9	32.3	32.7	31.6
Laramie "	8/22	10:15A	64	32.2	----	32.1	32.4	32.8	32.4	32.9	32.0	32.9	32.4	31.8	32.1
Cheyenne "	"	4:00P	82	32.1	----	32.1	32.1	32.4	32.8	32.4	32.2	32.9	32.3	32.0	32.1
North Platte, Nebraska	8/23	12:30A	52	32.0	----	32.3	31.9	32.5	32.2	32.6	32.2	32.5	32.4	31.9	32.2
Grand Island "	"	9:00A	72	32.4	----	32.1	31.0	32.6	32.4	32.8	32.3	32.7	32.4	32.1	32.3
Council Bluffs, Iowa	"	3:40P	91	32.5	----	32.3	32.3	32.4	32.7	32.7	32.4	32.8	32.5	32.1	32.1
" "	"	8:00P	82	32.7	----	32.3	32.4	32.8	32.4	32.8	32.3	32.8	33.2	33.5	32.3
Boone "	8/24	3:15A	56	32.3	----	32.0	32.0	32.5	32.3	32.7	32.3	32.6	32.3	32.5	32.0
Clinton "	"	10:30A	77	32.6	----	32.0	32.0	32.8	32.3	32.7	32.3	32.8	32.2	31.9	31.9
Proviso, Illinois	"	7:00P	77	32.2	----	32.2	32.5	32.5	32.2	32.7	32.3	32.7	32.3	32.0	32.1
Blue Island "	8/25	2:15A	64	32.7	----	32.0	32.4	32.4	32.3	32.8	32.4	32.8	32.2	32.1	32.1
Dolton "	"	7:30A	72	32.6	----	32.1	32.3	32.5	32.2	32.5	32.5	32.5	32.3	31.7	31.8
Logansport, Indiana	"	11:45A	82	32.6	----	32.3	33.2	32.6	32.4	32.9	32.4	32.8	32.3	32.1	32.0
Columbus, Ohio	"	6:45P	76	32.9	----	32.4	35.2	32.4	32.4	32.7	32.5	32.8	----	32.8	31.7
Pitcairn, Pennsylvania	8/26	4:00A	60	32.8	----	32.2	34.8	32.9	32.3	33.0	32.4	32.7	32.8	32.8	32.7
Altoona "	"	9:10A	68	32.8	----	32.1	34.6	32.5	32.3	32.6	32.6	32.5	32.5	33.5	32.2
Enola "	"	1:45P	84	33.0	----	32.4	35.5	32.7	32.4	32.7	32.6	32.8	32.3	32.4	32.0
Harismus Cove, N. J.	8/27	2:30A	68	32.3	----	32.4	36.8	32.3	31.9	32.8	32.0	32.3	32.9	32.9	31.9
New York City	"	7:00P	75	32.5	----	32.7	38.5	32.3	32.2	32.7	32.8	32.3	32.9	33.0	31.9

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 — Car initial and No. PFE 95529

Contents of Car Lettuce — Test U. Calif. 1939-3 — P F E 197 — Car M

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	9:15A	63	51.5	----	51.5	51.5	32.0	55.0	52.1	32.5	55.0	51.0	32.0	49.5
" "	"	9:50A	70	46.2	----	30.5	46.5	31.5	30.2	47.6	32.0	29.0	46.7	32.6	41.0
" "	"	11:30A	73	40.8	----	29.5	41.0	31.0	28.5	41.1	31.5	29.0	41.3	32.6	40.0
" "	"	4:30P	60	35.1	----	30.5	35.3	31.8	29.8	34.4	31.8	30.4	35.5	33.8	36.7
" "	"	9:30P	58	33.5	----	30.9	33.4	32.0	29.1	33.1	31.9	30.5	34.0	33.3	35.5
Watsonville "	8/19	2:00A	55	31.4	----	30.6	32.3	31.6	29.6	31.9	31.8	31.0	33.3	32.6	34.3
San Jose "	"	5:45A	58	32.4	----	31.0	32.2	31.8	30.3	31.9	31.9	31.3	33.3	32.7	34.2
Roseville "	"	3:30P	101	32.1	----	31.2	32.3	31.8	30.5	31.8	31.8	31.4	33.2	32.7	33.8
Sparks, Nevada	8/20	3:15A	60	31.8	----	31.3	32.0	31.8	30.7	31.8	31.9	31.4	32.9	32.3	33.3
Red House "	"	2:20P	101	31.8	----	31.4	32.2	31.4	30.8	31.7	31.9	31.7	32.9	32.7	33.2
Carlin "	"	7:00P	72	31.8	----	31.4	32.2	31.8	30.8	31.5	31.9	31.9	32.7	32.8	33.0
Montello "	8/21	5:00A	58	31.9	----	31.3	31.9	31.8	30.9	31.4	31.9	31.8	32.9	32.8	33.0
Ogden, Utah	"	12:00N	90	31.8	----	31.6	32.1	31.7	31.1	31.5	32.0	31.7	32.9	32.8	33.2
Evanston, Wyoming	"	7:00P	77	31.9	----	31.7	32.7	32.3	31.3	31.8	32.4	32.0	33.2	32.9	33.5
Green River "	"	11:00P	64	31.8	----	31.8	32.7	32.3	30.9	31.5	32.1	31.9	33.2	33.5	33.4
Laramie "	8/22	10:15A	64	31.6	----	31.7	32.7	31.9	31.3	31.7	31.9	31.8	32.7	32.6	33.2
Cheyenne "	"	4:00P	82	31.6	31.8	31.8	32.4	31.8	31.2	31.5	31.9	31.9	32.9	32.8	32.4
North Platte, Neb.	8/23	12:30A	52	31.3	31.4	31.5	31.8	31.8	30.8	31.4	31.9	32.1	32.7	32.4	33.1
Grand Island, "	"	9:00A	72	31.4	----	31.8	31.8	31.7	31.2	31.7	32.1	32.2	32.4	32.7	33.2
Council Bluffs, Iowa	"	3:40P	91	31.7	----	32.2	32.3	31.9	31.3	31.5	31.9	31.9	32.6	32.9	33.2
" " "	"	8:00P	82	31.6	----	32.1	32.1	31.8	31.2	31.5	32.2	32.2	34.2	32.5	33.3
Boone "	8/24	3:15A	56	31.7	----	31.9	32.0	32.0	31.2	31.8	32.2	32.2	32.9	32.6	33.1
Clinton "	"	10:30A	77	31.3	----	31.9	31.9	31.8	31.2	31.4	32.2	31.8	32.3	32.3	32.6
Proviso, Illinois	"	7:00P	77	31.3	----	32.0	32.0	31.8	31.3	31.7	32.1	31.8	32.2	32.4	32.4
Blue Island "	8/25	2:15A	64	31.3	----	32.1	32.0	31.9	31.4	31.3	32.0	31.8	32.3	32.6	32.7
Dolton "	"	7:30A	72	31.5	----	32.0	31.8	31.8	30.5	31.4	32.3	32.0	32.3	32.5	32.8
Logansport, Ind.	"	11:45A	82	31.8	----	32.1	32.2	31.6	31.4	31.8	32.2	32.2	32.3	32.4	32.6
Columbus, Ohio	"	6:45P	76	----	----	32.1	32.3	32.7	31.8	31.9	32.3	32.2	32.4	----	33.0
Pitcairn, Pa.	8/26	4:00A	60	----	----	32.4	32.2	32.7	32.2	32.1	32.3	32.2	32.6	----	34.5
Altoona "	"	9:10A	68	----	----	32.1	31.7	31.7	31.5	31.4	32.1	31.9	31.8	----	32.8
Enola "	"	1:45P	84	----	33.9	32.2	31.7	31.9	31.4	31.8	32.2	32.2	32.3	----	33.5
Harismus Cove, N. J.	8/27	2:30A	68	31.6	34.8	32.3	31.7	31.8	31.4	31.4	31.8	31.9	32.7	----	32.4
New York	"	7:00P	76	31.2	36.4	32.7	31.8	32.2	32.1	31.6	32.5	32.7	----	32.2	32.5
New York	8/28	7:00P		32.2	36.4	33.8	32.2	32.3	32.3	32.3	32.5	----	33.8	----	32.6

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 95738

Contents of Car Lettuce Test . Calif. . 1939-S. PFE 197 Car N

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	10:30A	75	50.2	31.8	50.5	50.1	32.0	50.5	53.0	52.0	31.5	52.4	34.0	44.5
" "	"	11:15A	73	45.2	31.6	30.8	46.1	31.8	31.0	30.5	44.8	31.3	46.9	33.8	42.7
" "	"	4:30P	60	35.3	32.0	30.9	36.1	32.3	31.2	31.0	34.8	32.0	36.4	33.7	37.5
" "	"	9:30P	58	32.2	31.9	31.0	33.5	32.3	31.2	30.8	33.5	32.0	33.9	32.6	34.4
Watsonville "	8/19	3:00A	55	32.3	32.1	31.0	32.9	32.6	31.3	31.1	32.5	31.9	32.7	32.1	33.8
San Jose "	"	5:45A	58	32.3	32.1	31.2	32.4	32.6	31.5	31.1	32.4	32.2	32.4	32.2	33.6
Roseville "	"	3:30P	101	32.1	32.2	31.7	32.4	32.7	31.9	31.6	32.3	32.3	32.2	32.0	32.8
Sparks, Nevada	8/20	3:15A	60	32.1	32.1	31.4	32.3	32.6	31.6	31.2	32.3	32.3	32.3	32.1	32.5
Red House "	"	2:20P	101	31.9	32.2	31.4	32.0	32.7	31.6	31.3	32.4	32.2	32.1	32.2	32.3
Carlin "	"	7:00P	72	32.1	32.2	31.5	32.1	32.4	31.8	31.6	32.2	32.1	32.1	32.1	32.2
Montello "	8/21	5:00A	58	32.2	32.2	31.8	32.0	32.8	31.6	31.3	32.3	32.1	32.2	32.4	32.2
Ogden, Utah	"	12:00N	90	32.0	32.6	31.8	31.9	32.6	31.4	31.5	32.3	32.2	32.1	32.1	32.3
Evanston, Wyoming	"	7:00P	77	32.0	32.8	32.2	32.7	33.3	31.3	31.8	32.4	32.2	32.2	33.3	32.5
Green River "	"	11:00P	64	32.0	32.6	31.7	32.5	33.1	31.4	31.5	32.2	32.3	32.5	32.6	32.7
Laramie "	8/22	10:15A	64	31.9	32.6	31.9	32.0	32.4	31.9	31.6	32.4	32.2	32.2	32.2	32.4
Cheyenne "	"	4:00P	82	32.0	32.2	31.7	32.3	32.5	31.6	31.3	32.2	32.1	32.1	32.6	32.6
North Platte, Neb.	8/23	12:30A	52	31.9	31.9	31.4	32.0	32.3	31.2	31.3	32.1	32.1	32.1	32.2	32.4
Grand Island "	"	9:00A	72	31.9	32.1	31.7	32.0	32.3	31.2	31.3	32.2	32.2	32.2	31.9	32.7
Council Bluffs, Iowa	"	3:40P	91	32.0	32.2	32.1	32.1	32.6	31.2	31.7	32.3	32.3	32.2	32.2	32.4
" "	"	8:00P	82	31.9	32.1	31.8	32.3	32.5	31.3	31.4	32.1	32.1	32.0	33.3	32.7
Boone "	8/24	3:15A	56	32.0	32.0	31.7	32.0	32.6	31.2	31.6	32.2	32.2	32.2	32.1	33.1
Clinton "	"	10:30A	77	32.0	32.2	31.8	31.8	32.3	31.3	31.6	32.1	31.9	32.0	32.2	32.4
Proviso, Illinois	"	7:00P	77	31.8	32.2	31.8	31.6	32.2	31.3	31.2	32.1	31.9	32.1	32.4	32.4
Blue Island "	8/25	2:15A	64	31.8	32.1	32.1	32.0	32.3	31.3	31.4	32.2	31.8	31.8	32.2	32.7
Dolton "	"	7:30A	72	32.0	32.1	31.7	31.9	32.5	31.7	31.7	32.2	32.0	32.4	32.0	32.5
Logansport, Ind.	"	11:45A	82	32.0	32.9	32.3	32.2	32.8	31.5	31.5	32.2	32.3	32.8	32.4	32.3
Columbus, Ohio	"	6:45P	76	31.5	32.5	32.1	32.3	32.8	31.5	32.1	32.2	32.0	32.3	33.1	32.8
Pitcairn, Pa.	8/26	4:00A	60	32.5	34.6	32.8	32.3	35.2	32.2	31.3	32.7	32.3	34.1	----	35.8
Altoona "	"	9:10A	68	31.9	32.4	31.8	32.1	32.5	31.2	30.6	32.4	33.6	32.5	----	35.0
Enola "	"	1:45P	84	31.9	33.1	32.2	32.5	32.8	32.4	31.2	32.2	32.4	32.6	----	33.1
Harismus Cove, N. J.	8/27	2:30A	68	31.6	33.6	32.4	31.8	32.7	31.0	31.6	32.2	32.1	34.6	----	32.7
New York	"	7:00P	75	31.5	34.8	32.9	32.0	32.8	31.3	31.2	32.2	37.3	33.6	----	33.1

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 — Car initial and No. PFE 100292

Contents of Car Lettuce — Test Calif. 1939-S. PFE 197 Car P

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	2:00P	67	44.1	32.2	31.7	47.2	32.0	32.2	47.0	32.2	31.3	42.2	48.5	41.5
" "	"	5:30P	58	37.6	32.2	31.8	40.0	32.4	32.3	38.5	32.2	31.6	37.9	39.5	39.1
" "	"	10:00P	58	34.8	32.0	31.8	36.9	32.3	32.2	35.9	32.2	31.8	35.9	37.3	36.7
Watsonville "	8/19	3:00A	55	33.4	31.8	31.5	35.0	32.3	32.0	34.5	31.8	31.3	34.3	35.8	35.2
San Jose "	"	5:45A	58	32.9	32.3	31.8	34.5	32.3	32.1	33.4	32.0	31.8	34.0	35.0	34.2
Roseville "	"	3:30P	101	32.6	32.2	32.0	33.7	32.3	32.0	32.7	32.0	31.7	32.7	33.8	33.0
Sparks, Nevada	8/20	3:15A	60	32.0	32.0	31.7	33.2	32.5	32.0	32.5	32.0	32.0	32.5	33.0	32.7
Red House "	"	2:20P	101	32.1	32.0	32.0	33.0	32.3	32.2	32.2	32.0	31.7	32.3	32.8	32.5
Carlin "	"	7:00P	72	32.1	32.1	32.0	32.8	32.3	32.2	32.0	32.1	31.8	32.4	32.7	32.7
Montello "	8/21	5:00A	58	32.4	32.5	32.3	33.0	32.5	32.5	32.2	32.3	32.0	32.5	32.8	33.0
Ogden, Utah	"	12:00N	90	32.0	31.9	32.1	32.7	32.2	32.0	32.0	31.8	31.8	32.3	32.4	32.5
Evanston, Wyoming	"	7:00P	77	32.1	32.0	32.0	32.8	32.3	32.1	32.0	32.1	31.6	32.2	32.2	32.5
Green River "	"	11:00P	64	32.2	32.0	32.0	32.8	32.3	32.1	32.0	32.1	31.8	32.3	32.5	32.8
Laramie "	8/22	10:15A	64	32.3	32.5	32.2	32.8	32.3	32.2	32.0	32.1	31.8	32.3	32.5	32.5
Cheyenne "	"	4:00P	82	32.2	32.2	32.2	32.8	32.3	32.2	32.0	32.3	32.2	32.3	32.5	32.7
North Platte, Neb.	8/23	12:30A	52	32.4	32.0	32.2	32.6	32.1	32.1	32.2	31.8	31.8	32.3	32.4	32.3
Grand Island "	"	9:00A	72	32.4	32.2	32.3	32.6	32.1	32.2	32.0	32.0	32.0	32.3	32.5	32.7
Council Bluffs, Iowa	"	3:40P	91	32.2	32.2	31.8	32.6	32.2	32.2	32.0	32.0	32.0	32.3	32.4	32.5
" "	"	8:00P	82	32.3	32.2	32.1	32.7	32.4	32.3	32.0	32.3	31.8	32.4	32.3	32.7
Boone "	8/24	3:15A	56	32.4	32.2	31.7	32.8	32.3	32.1	32.0	32.2	32.0	32.2	32.4	32.7
Clinton "	"	10:30A	77	32.6	32.3	32.0	32.7	32.2	32.2	32.0	32.3	32.0	32.2	32.6	32.6
Proviso, Illinois	"	7:00P	77	32.2	32.0	33.0	32.5	32.2	32.2	32.0	32.2	32.0	32.2	32.6	32.5
Blue Island "	8/25	2:15A	64	32.6	32.8	32.4	33.3	32.9	32.5	32.3	32.7	32.6	32.9	34.9	33.3
Dolton "	"	7:30A	72	32.4	32.5	32.0	32.7	32.5	32.2	32.0	32.3	32.0	32.5	32.5	33.3
Logansport, Ind.	"	11:45A	82	32.4	32.2	32.2	32.3	32.1	32.3	32.0	32.2	31.7	32.3	32.2	33.0
Columbus, Ohio	"	6:45P	76	32.4	32.3	32.3	32.8	32.3	32.3	32.0	32.2	32.0	32.3	32.8	33.0
Pitcairn, Pa.	8/26	4:00A	60	32.4	31.7	32.3	32.5	32.0	32.3	32.0	32.2	32.0	32.2	32.6	32.7
Altoona "	"	9:10A	68	32.0	31.8	32.0	32.5	32.1	32.3	31.7	31.8	32.0	32.1	32.3	32.5
Enola "	"	1:45P	84	32.3	32.3	32.3	32.8	32.4	32.4	32.1	32.3	32.0	32.3	32.7	32.7
Harismus Cove , N. J.	8/27	2:30A	68	32.4	33.2	34.2	32.7	32.5	32.4	32.2	32.9	32.9	32.3	32.7	32.8
New York	"	7:00P	76	32.4	32.2	35.3	32.7	32.2	32.2	32.0	32.2	32.0	32.0	32.3	32.7

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

M. C. 37470 Centerline

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 | Car initial and No. PFE 94667

Contents of Car Carrot | Test Calif. 1939-S. - PFE 197 | Car R

PLACE (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	10:00A	62	46.2	47.3	42.5	56.7	54.3	51.9	35.9	56.1	57.2	51.3	40.3	58.8
" "	"	4:00P	60	42.0	43.8	35.3	30.2	38.7	38.9	33.0	31.5	40.5	39.3	33.8	31.2
" "	"	9:30P	58	40.2	43.1	33.6	30.2	35.7	35.3	32.4	31.0	36.8	35.5	32.8	30.9
Watsonville "	19	2:00A	55	39.2	42.3	33.1	30.5	34.3	33.9	32.2	31.3	35.2	34.0	32.3	31.2
San Jose "		5:45A	59	38.5	41.6	32.6	30.7	34.0	33.2	32.2	31.3	34.3	33.1	32.1	31.0
Roseville "		3:30P	101	38.3	41.3	32.5	31.2	33.3	32.6	32.2	31.3	33.5	32.5	32.2	31.2
Sparks, Nevada	20	3:15A	60	38.9	41.9	32.6	31.5	33.2	32.6	32.0	31.8	33.3	32.5	32.5	31.3
Red House "		2:20P	101	39.3	41.5	32.3	31.6	33.0	32.3	32.0	31.5	33.0	32.2	31.8	31.3
Carlin "		7:00P	72	39.7	42.1	32.5	31.7	33.3	32.3	32.0	31.5	33.2	32.3	31.8	31.5
Montello "	21	5:00A	58	39.3	42.3	32.3	31.8	33.2	32.6	32.3	31.5	33.0	32.5	32.5	31.5
Ogden, Utah		12:Noon	90	39.2	41.8	32.5	31.3	32.8	32.1	31.8	31.3	32.7	32.0	31.8	31.3
Evanston, Wyoming		7:00P	77	39.8	42.6	32.3	31.3	33.0	32.4	32.2	31.5	33.0	32.0	31.8	31.6
Green River "		11:00P	64	40.6	43.3	32.5	31.5	33.0	32.4	32.0	32.0	33.0	32.3	32.1	31.9
Laramie "	22	10:15A	64	39.8	42.7	32.5	31.7	33.2	32.3	32.2	31.8	32.3	32.2	31.9	31.5
Cheyenne "		4:00P	82	40.3	43.0	32.3	31.5	33.0	32.3	31.7	31.9	32.8	32.0	32.0	31.5
North Platte, Neb.	23	12:30A	52	41.0	44.0	32.6	31.6	32.8	32.2	32.0	31.6	32.8	32.0	32.0	31.5
Grand Island, "		9:00A	72	40.5	43.6	32.7	31.5	33.0	32.4	32.0	32.0	33.0	32.3	31.9	31.5
Council Bluffs, Iowa		3:40P	91	40.8	43.8	32.6	31.7	32.4	32.3	32.0	31.7	33.0	32.0	32.0	31.5
" "		8:00P	82	41.3	44.1	32.8	31.7	33.0	32.4	32.0	32.0	32.9	32.2	32.2	31.4
Boone "	24	3:15A	56	41.7	44.6	32.5	31.3	33.0	31.9	32.0	31.5	33.0	32.0	31.9	31.5
Clinton "		10:30A	77	40.6	44.5	32.7	31.7	33.0	32.3	32.0	31.9	33.0	32.0	32.0	31.7
Proviso, Illinois		7:00P	77	41.8	44.5	33.3	31.8	32.8	32.2	32.0	31.7	32.7	31.7	31.8	31.6
Blue Island "	25	2:15A	64	41.5	44.6	33.3	32.0	33.0	32.1	32.0	31.5	33.0	31.8	31.8	31.5
Dolton "		7:30A	72	41.7	44.8	32.8	32.0	32.8	31.9	32.0	31.7	32.8	32.0	32.0	31.7
Logansport, Ind.		11:45A	82	41.8	44.7	32.9	32.3	33.0	32.3	32.2	32.0	33.2	32.0	32.2	32.0
Columbus, Ohio		6:45P	76	42.8	45.6	32.5	32.2	32.7	32.1	32.2	32.8	32.7	32.0	31.9	31.5
Pitcairn, Pa.	26	4:00A	60	42.8	45.9	32.9	32.5	32.8	31.9	32.1	31.8	33.0	32.0	32.0	31.6
Altoona "		9:15A	68	42.8	46.1	32.6	32.1	32.8	32.1	32.2	32.0	33.0	32.1	32.1	32.0
Enola "		1:45P	84	43.1	44.1	32.3	32.5	33.0	32.1	32.0	32.0	33.2	32.2	31.8	32.2
Harismus Cove, N.J.	27	2:30A	68	44.1	47.0	32.7	33.2	32.8	32.2	32.2	32.3	33.0	32.0	31.9	32.5
New York City		7:00P	76	43.8	47.5	32.8	33.6	32.7	32.3	32.0	31.5	32.8	32.3	31.7	32.3

Observed by _____

M. C. 25 South Wall
TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939. Car initial and No. PFE No. 94667.

Contents of Car Carrot Test Calif. 1939-3 PFE 197 Car R

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	10:00A	62	43.9	51.2	37.3	61.1	55.2	52.4	59.6	58.2	46.6	62.3	59.1	65.4
"		11:25A	73	40.2	46.6	44.8	31.5	51.7	50.2	51.3	31.2	45.1	52.2	49.0	31.0
"		4:00P	60	35.0	38.7	32.8	32.0	45.2	45.7	39.7	31.2	38.8	39.8	39.7	30.7
"		9:30P	58	33.2	35.6	32.2	31.7	41.8	42.1	35.4	31.0	37.3	35.8	35.7	30.6
Watsonville "	8/19	2:00A	55	32.6	34.0	32.2	32.0	40.2	40.6	34.0	31.2	36.0	34.7	34.0	31.2
San Jose "		5:45A	59	32.3	33.6	32.3	32.0	38.8	39.6	33.2	31.0	35.5	34.0	33.3	31.0
Roseville "		3:30P	101	32.0	32.7	32.1	32.0	37.7	38.5	32.5	31.3	34.8	32.8	32.5	31.1
Sparks, Nevada	8/20	3:15A	60	32.0	32.5	32.0	32.3	37.3	38.7	32.3	31.4	35.1	32.5	32.3	31.0
Red House "		2:20P	101	32.0	32.4	32.2	32.4	38.0	39.0	31.7	31.3	35.1	32.5	32.0	31.0
Carlin "		7:00P	72	31.8	32.5	32.3	32.5	38.6	39.8	32.0	31.6	35.7	32.6	32.3	31.2
Montello "	8/21	5:00A	58	32.0	32.5	32.5	32.5	38.0	39.6	32.0	31.7	36.0	32.5	32.5	31.3
Ogden, Utah		12 Noon	90	31.8	32.3	32.3	32.2	37.6	39.0	32.0	31.5	35.9	32.3	32.2	31.2
Evanston, Wyoming		7:00P	77	32.0	32.5	32.3	32.6	39.2	40.0	31.6	31.5	36.8	32.4	32.2	31.3
Green River "		11:00P	64	31.8	32.0	32.0	32.2	39.0	40.0	31.6	31.3	37.0	32.3	32.1	31.0
Laramie "	8/22	10:15A	64	32.0	32.3	32.3	32.6	38.3	39.3	32.0	31.6	37.0	32.5	32.3	31.3
Cheyenne "		4:00P	82	31.7	32.5	32.3	32.7	38.8	39.2	32.0	31.5	37.1	32.4	32.2	31.2
North Platte, Neb.	8/23	12:30A	52	31.7	32.4	32.3	32.5	39.3	39.8	32.0	32.0	37.5	32.1	32.3	31.5
Grand Island, Nebr.		9:00A	72	32.0	32.2	32.0	32.5	38.5	39.3	32.0	31.7	37.2	32.3	32.3	31.0
Council Bluffs, Iowa		3:40P	91	31.8	32.6	32.2	33.0	40.0	40.0	32.0	31.7	37.5	32.1	32.2	31.1
" "		8:00P	82	32.0	32.5	32.2	32.9	40.7	40.9	32.3	32.1	37.9	32.5	32.4	31.4
Boone "	8/24	3:15A	56	32.0	32.3	32.0	34.0	40.3	41.0	32.0	31.7	38.3	32.3	32.0	31.6
Clinton "		10:30A	77	32.0	32.5	32.2	34.0	40.3	40.5	32.0	32.0	38.0	32.2	32.2	32.0
Proviso, Illinois		7:00P	77	31.8	32.5	33.0	34.2	41.3	41.2	32.0	31.7	38.3	32.2	32.3	32.3
Blue Island "	8/25	2:15A	64	32.0	32.3	33.0	34.2	40.7	41.2	32.0	31.5	38.2	32.2	32.3	31.8
Dolton "		7:30A	72	31.8	32.5	33.0	34.3	40.2	40.5	32.0	32.0	38.0	32.0	32.2	31.6
Logansport, Ind.		11:45A	82	32.3	32.7	33.2	33.3	40.8	41.0	32.2	32.0	38.0	32.5	33.5	32.0
Columbus, Ohio		6:45P	76	32.0	32.5	32.5	33.0	41.3	41.3	32.0	32.0	37.8	32.5	32.5	33.3
Pitcairn, Pa.	8/26	4:00A	60	32.0	32.5	32.6	32.7	41.3	41.5	32.2	32.2	38.1	32.1	33.0	32.8
Altoona "		9:15A	68	32.2	32.8	32.2	33.2	41.2	41.3	32.2	32.3	38.0	32.5	33.3	32.7
Enola "		1:45P	84	32.3	32.8	32.2	33.7	41.2	41.2	32.0	32.2	38.0	32.5	33.0	33.3
Harismus Cove, N. J.	8/27	2:30A	68	32.3	32.7	32.1	34.0	41.7	42.0	32.0	32.5	38.5	32.5	33.6	34.0
New York City		7:00P	76	32.2	32.7	32.0	34.3	41.8	42.3	32.0	33.0	38.5	32.5	33.5	35.0

M. C. 59 Southwall

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939 Car initial and No. PFE 95737

Contents of Car Carrot Test Calif. 1939-3 PFE 197 Car S

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	12:00N	66	60.0	58.4	56.7	58.7	43.2	61.8	58.0	60.7	64.3	66.3	65.8	62.0
"		3:15P	65	50.2	47.8	47.2	32.2	41.7	52.0	47.3	31.7	51.3	50.2	52.0	32.5
"		5:00P	60	46.3	42.7	41.5	32.0	40.2	49.2	42.3	31.3	46.7	44.2	46.7	31.7
"		9:30P	58	42.3	38.7	36.7	33.5	37.7	44.3	37.8	31.2	41.8	39.3	40.7	31.7
Watsonville "	8/19	2:00A	55	40.0	36.5	34.8	32.0	36.3	41.5	35.8	31.5	40.0	36.7	38.0	31.7
San Jose "		5:45A	58	38.5	36.5	34.0	32.0	35.0	39.5	34.5	31.5	38.8	35.5	35.8	31.5
Roseville "		3:30P	101	37.4	35.5	32.8	31.7	34.3	37.5	33.3	31.7	37.6	34.0	34.0	31.8
Sparks, Nevada	8/20	3:15A	60	37.5	36.0	32.8	32.0	34.5	37.2	33.0	32.0	38.0	33.3	33.2	32.2
Red House "		2:20P	101	38.3	35.8	32.7	33.3	34.8	37.1	32.6	32.0	38.3	33.0	32.7	31.5
Carlin "		7:00P	72	38.8	37.0	32.8	32.0	35.0	37.2	32.5	32.2	38.5	33.1	32.8	31.8
Montello "	8/21	5:00A	58	38.0	36.5	32.6	31.8	35.0	36.5	32.5	32.3	38.0	33.0	32.6	31.5
Ogden, Utah		12:00N	90	37.5	36.3	32.3	33.0	34.8	36.6	32.3	32.3	37.8	32.6	32.5	31.6
Evanston, Wyo.		7:00P	77	39.2	37.5	32.5	32.1	35.4	38.0	32.0	32.3	39.8	32.8	32.5	31.6
Green River "		11:00P	64	39.4	37.7	32.5	32.0	36.0	38.2	32.5	32.5	39.0	32.6	32.5	31.5
Laramie "	8/22	10:15A	64	37.8	36.5	32.4	32.0	35.2	37.2	32.3	32.5	38.2	32.8	32.5	31.8
Cheyenne "		4:00P	82	38.0	36.1	32.6	32.2	35.3	37.3	32.2	32.3	38.0	32.8	32.4	31.8
North Platte, Neb.	8/23	12:30A	52	38.7	36.5	32.6	32.1	35.7	37.8	32.1	32.2	38.5	32.6	32.6	31.8
Grand Island, Nebr.		9:00A	72	38.3	35.8	32.5	32.2	35.6	37.5	32.3	32.5	38.2	32.7	32.3	31.8
Council Bluffs, Iowa		3:40P	91	40.0	37.0	32.6	32.5	36.3	38.4	32.3	32.5	37.6	32.7	32.8	31.8
" "		8:00P	82	40.4	38.1	32.7	32.6	36.8	39.2	32.4	32.7	37.9	32.7	32.4	32.0
Boone "	8/24	3:15A	56	40.1	38.0	32.5	32.4	37.2	38.7	32.2	32.3	37.2	32.7	32.3	32.0
Clinton "		10:30A	77	40.0	37.8	32.7	32.5	37.2	38.4	32.3	32.5	36.5	32.6	32.5	32.2
Proviso, Illinois		7:00P	77	41.3	38.7	32.6	33.3	37.7	39.3	32.0	32.2	37.7	32.7	32.3	31.7
Blue Island "	8/25	2:15A	64	41.0	38.5	32.7	32.2	37.5	39.2	32.3	32.5	37.7	32.6	32.3	31.6
Dolton "		7:30A	72	40.5	38.5	32.8	33.6	38.0	39.5	32.2	32.7	38.2	32.8	32.7	32.0
Logansport, Ind.		11:45A	82	40.7	38.8	32.6	32.5	38.2	39.3	32.3	32.6	38.3	32.7	32.3	32.0
Columbus, Ohio		6:45P	76	41.2	38.8	32.3	32.3	38.3	39.7	32.1	32.5	39.0	32.5	32.5	32.5
Pitcairn, Pa.	8/26	4:00A	60	41.1	38.5	32.8	32.3	38.8	39.8	32.3	32.3	39.3	32.8	32.8	33.8
Altoona "		9:10A	68	40.3	38.0	32.5	32.5	38.8	39.5	32.2	32.7	39.3	33.2	32.6	32.2
Enola "		1:45P	84	40.2	37.7	32.5	32.3	38.7	39.5	32.2	32.5	39.2	32.8	32.3	31.8
Harismus Cove, N. J.	8/27	2:30A	68	41.3	38.5	32.5	32.6	39.2	40.0	32.5	32.7	40.5	32.8	32.8	32.3
New York City		7:00P	75	41.8	38.8	32.5	32.8	39.3	40.2	32.3	32.5	40.8	32.7	33.0	33.0

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering Barger

M. C. 30354 Centerline

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939

Car initial and No. PFE 95737

Contents of Car Carrot Test Calif. 1939-5 PFE 197 Car S

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	12:00N	66	46.2	56.4	40.7	46.5	59.5	55.4	47.0	60.3	65.0	65.5	42.3	64.7
"		3:30P	65	37.0	43.2	36.0	31.2	45.0	42.7	43.5	31.5	48.5	53.0	34.5	31.8
"		5:00P	60	35.5	39.2	34.7	31.3	31.8	40.0	32.7	31.3	33.7	46.2	33.2	31.2
"		9:30P	58	33.4	35.0	33.2	30.8	38.3	35.7	32.4	31.3	37.9	40.4	32.4	31.2
Watsonville "	8/19	3:00A	55	32.8	33.3	33.1	31.5	36.5	34.0	32.3	31.3	35.5	37.2	32.3	31.0
San Jose "		5:45A	58	32.6	32.5	32.5	31.2	35.0	33.2	32.2	31.0	34.2	35.5	32.0	31.0
Roseville "		3:30P	101	32.3	32.0	32.7	31.4	33.5	32.5	32.0	31.2	33.2	33.8	32.0	31.0
Sparks, Nevada	8/20	3 :15A	60	32.2	32.0	32.7	31.5	32.8	32.7	32.0	31.8	33.0	33.1	32.2	31.5
Red House "		2:20P	101	32.2	32.0	32.5	31.5	32.3	32.0	32.0	31.3	32.8	32.7	32.1	31.3
Carlin "		7:00P	72	32.2	32.0	32.5	31.7	32.3	32.4	32.0	31.7	32.9	32.5	32.2	31.3
Montello "	8/21	5:00A	58	32.3	32.0	32.5	31.5	32.3	32.3	32.0	31.8	32.8	32.5	32.0	31.2
Ogden, Utah		12:00N	90	32.2	32.0	32.5	31.6	32.0	32.3	32.0	31.8	32.8	32.5	31.8	31.0
Evanston, Wyoming		7:00P	77	32.2	31.8	32.5	31.7	32.0	32.2	31.8	31.6	32.6	32.3	32.0	31.2
Green River "		11:00P	64	32.3	32.0	32.5	31.8	32.3	32.2	32.0	32.0	33.0	32.3	32.2	31.2
Laramie "	8/22	10:15A	64	32.2	31.7	32.5	31.8	32.1	32.2	32.0	31.7	32.8	32.2	32.0	31.3
Cheyenne "		4:00P	82	32.2	32.0	32.5	31.7	32.0	32.3	32.0	32.0	32.7	32.2	32.0	31.3
North Platte, Neb.	8/23	12:30A	52	32.3	32.0	32.5	31.7	31.9	32.2	31.8	31.8	32.8	32.1	31.8	31.3
Grand Island, Nebr.		9:00A	72	32.3	31.8	32.6	31.8	32.0	32.2	32.0	31.8	32.8	32.2	32.0	31.5
Council Bluffs, Iowa		3:40P	91	32.3	32.0	32.7	31.9	32.2	32.2	32.0	32.0	32.7	32.2	31.7	31.2
" " " "		8:00P	82	31.9	31.7	32.2	31.8	31.8	32.2	31.7	31.8	32.7	32.2	31.8	31.3
Boone "	8/24	3:15A	56	32.2	31.7	32.3	31.9	32.0	32.0	32.0	31.8	32.8	31.8	32.0	31.3
Clinton "		10:30A	77	32.3	31.8	32.3	32.0	32.0	32.2	31.8	31.8	32.7	32.0	31.8	31.3
Proviso, Illinois		7:00P	77	32.2	31.7	32.3	32.0	32.1	32.0	31.8	31.8	32.8	31.8	31.5	31.0
Blue Island "	8/25	2:15A	64	31.8	31.5	32.3	32.0	32.0	32.0	32.0	31.7	32.7	31.8	31.8	31.2
Dolton, Illinois		7:30A	72	32.0	31.7	32.5	31.8	31.8	32.0	31.8	32.0	33.0	32.2	32.2	31.5
Logansport, Ind.		11:45A	82	32.3	32.0	32.3	32.3	32.0	32.2	32.0	32.0	32.8	31.8	31.8	31.3
Columbus, Ohio		6:45P	76	32.2	31.8	32.5	32.3	31.9	32.2	32.0	31.8	32.8	32.0	32.0	31.5
Pitcairn, Pa.	8/26	4:00A	60	32.3	32.0	32.7	32.3	31.8	32.2	32.0	32.0	32.7	32.0	31.8	31.3
Altoona "		9:10A	68	32.3	32.2	32.8	32.3	32.3	32.3	32.2	32.0	32.8	32.0	32.0	31.7
Enola "		1:45P	84	32.2	32.0	32.6	32.5	32.0	32.2	32.0	32.0	32.8	32.0	32.0	31.5
Harismus Cove, N. J.	8/27	2:30A	68	32.5	32.0	32.7	32.5	32.0	32.3	32.0	32.0	32.8	32.0	32.0	31.7
New York City		7:00P	76	32.0	31.7	32.0	32.2	32.0	32.1	31.8	31.8	32.5	32.0	32.0	31.8

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observed by Doering, Barger

M. C. 27 Centerline

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939. Car initial and No. PFE 100078.

Contents of Car Carrot Test Calif. 1939-3. PFE 197. Car T.

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4 1/	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	3:30P	63	44.2	51.8	3209	40.3	56.3	58.2	46.8	58.4	----	----	----	----
" "	"	4:30P	62	42.4	48.8	33.3	40.9	50.8	54.7	42.3	57.1	55.1	64.7	54.2	59.2
" "	"	5:30P	60	41.4	45.0	32.7	34.6	44.5	47.4	37.9	30.9	46.3	54.8	45.3	32.3
" "	"	9:30P	58	36.2	39.2	32.1	33.6	37.3	38.7	33.3	30.3	39.9	41.4	37.6	32.2
Watsonville "	8/19	2:00A	55	34.0	35.5	31.8	33.2	34.5	34.8	32.2	30.8	37.0	36.0	34.0	32.0
San Jose "	"	5:45A	58	33.0	34.5	32.0	33.0	33.7	33.9	32.1	30.7	35.8	34.5	33.2	32.2
Roseville "	"	3 :30P	101	32.0	32.8	32.0	34.5	32.5	32.8	32.0	31.0	34.2	33.2	32.3	32.1
Sparks, Nevada	8/20	3:15A	60	31.8	32.2	31.8	34.3	32.5	33.0	32.0	31.8	33.3	32.8	32.0	32.0
Red House "	"	2:20P	101	31.9	32.5	32.0	35.5	32.2	32.4	32.0	31.5	33.0	32.8	31.8	32.3
Carlin "	"	7:00P	72	31.8	32.2	32.0	35.7	32.3	32.6	31.8	31.5	32.8	32.7	32.0	32.1
Montello "	8/21	5:00A	58	31.8	32.0	31.8	34.6	32.2	32.5	31.8	31.5	32.8	32.7	32.0	32.0
Ogden, Utah	"	12:00N	90	31.8	32.3	32.0	35.5	32.3	32.5	31.8	31.5	32.7	32.7	31.7	32.0
Evanston, Wyoming	"	7:00P	77	32.0	32.3	31.8	36.7	32.2	32.5	31.8	31.8	32.7	32.8	32.0	32.7
Green River, "	"	11:00P	64	31.7	32.2	31.7	36.0	31.8	32.3	31.8	31.8	33.0	33.3	32.5	32.0
Laramie "	8/22	10:15A	64	31.8	32.3	32.0	34.4	32.2	32.4	32.0	31.8	32.8	32.7	31.8	32.2
Cheyenne "	"	4:00P	82	31.8	32.3	31.8	35.7	32.3	32.5	32.0	32.0	32.8	32.8	32.0	32.2
North Platte, Neb.	8/23	12:30A	52	31.9	32.4	32.1	36.0	32.3	32.3	32.1	31.8	32.7	32.7	32.0	32.3
Grand Island, "	"	9:00A	72	32.0	32.3	32.0	35.0	32.3	32.5	32.1	32.2	33.0	32.6	32.0	32.3
Council Bluffs, Iowa	"	3:40P	91	32.1	32.4	32.1	37.5	32.3	32.5	32.0	32.0	33.0	32.6	32.0	32.3
" " "	"	8:00P	82	32.1	32.3	31.8	38.3	32.3	32.3	32.0	32.0	32.8	32.8	31.9	32.3
Boone "	8/24	3:15A	56	32.2	32.5	32.0	37.0	32.2	32.2	32.0	32.0	32.6	32.5	32.0	32.0
Clinton "	"	10:30A	77	32.1	32.5	31.8	37.3	32.3	32.3	32.0	32.3	32.6	32.7	31.8	32.2
Proviso, Illinois	"	7:00P	77	32.2	32.5	32.0	39.7	32.2	32.4	32.0	32.1	32.7	32.5	31.7	32.0
Blue Island "	8/25	2:15A	64	32.3	32.3	32.0	38.7	32.3	32.3	31.8	32.0	32.6	32.7	32.0	32.0
Dolton "	"	7:30A	72	32.5	32.7	32.3	38.5	32.5	33.1	32.2	32.3	33.0	33.0	32.2	32.5
Logansport, Ind.	"	11:45A	82	32.3	33.0	32.2	41.0	32.2	32.1	32.0	32.0	32.6	32.6	31.7	32.3
Columbus, Ohio	"	6:45P	76	32.3	32.7	32.0	42.0	32.3	32.3	32.0	32.0	32.8	32.7	32.0	32.3
Pitcairn, Pa.	8/26	4:00A	60	32.5	32.8	32.3	40.3	32.5	32.2	31.8	32.0	33.0	32.7	32.0	32.0
Altoona "	"	9:10A	68	32.5	33.5	32.7	39.3	32.6	31.5	32.2	32.1	33.1	32.7	31.8	32.3
Enola "	"	1:45P	84	32.1	33.1	33.1	41.6	32.2	32.4	31.9	32.0	32.9	32.7	31.9	32.2
Harismus Cove, N. J.	8/27	2:30A	68	32.3	33.3	41.3	42.5	32.7	32.7	32.0	32.1	33.3	32.8	32.0	32.5
New York	"	7:00P	76	32.6	33.8	42.3	43.0	32.8	32.5	32.2	32.1	33.2	32.7	32.2	32.3

U. S. DEPT. OF AGRICULTURE--Bureau of Plant Industry
Fruit and Vegetable Transportation Investigations

Observers Doering Barger

1/ Ice probably melted, exposing the thermometer to air.

M. C. 28 South Wall

TEMPERATURES IN TRANSIT

Date (Mo. and Yr.) Aug. 1939.

Contents of Car Carrots Test, Calif. 1939-5. PFE 197. Car T. PFE 100078.

Place (Town and State)	Day of Month	Time	Outside Temp.	1	2	3	4	5	6	7	8	9	10	11	12
Salinas, Calif.	8/18	3:00P	63	50.1	46.3	47.1	39.3	58.2	59.8	53.8	58.1	----	----	----	----
" "	"	4:30P	62	46.9	44.1	44.7	39.3	54.2	56.9	50.6	56.6	65.0	65.3	61.7	60.3
" "	"	5:30P	60	42.8	40.8	41.6	35.3	45.7	50.8	46.7	30.7	56.3	52.8	47.7	30.7
" "	"	9:30P	58	36.9	35.6	36.5	34.4	37.2	41.7	41.4	30.5	44.2	42.3	39.2	30.3
Watsonville "	8/19	2:00A	55	34.8	33.5	34.7	34.3	34.5	37.3	38.8	30.8	39.7	37.7	35.3	31.0
San Jose "	"	5:45A	58	33.5	32.5	33.7	33.9	33.0	34.8	36.3	30.8	37.5	35.7	34.0	31.0
Roseville "	"	3:30P	101	32.7	32.0	32.3	35.0	32.5	32.8	34.0	30.6	35.0	33.6	32.3	31.3
Sparks, Nevada	8/20	3:15A	60	32.5	32.0	32.0	35.3	32.5	32.5	33.0	31.1	35.7	33.0	32.3	31.8
Red House "	"	2:20P	101	32.5	31.8	32.3	36.1	32.5	32.1	32.8	31.1	35.7	32.8	32.2	31.6
Carlin "	"	7:00P	72	32.5	31.8	32.2	36.8	32.9	31.8	32.6	31.3	36.0	32.7	32.3	31.8
Montello "	8/21	5:00A	58	32.2	31.8	32.0	34.9	33.0	32.5	32.8	31.3	36.5	33.0	32.5	32.0
Ogden, Utah	"	12:00N	90	32.1	31.5	31.8	36.1	32.9	32.0	32.8	31.3	35.2	32.7	32.0	32.0
Evanston, Wyoming	"	7:00P	77	32.3	31.8	32.0	38.3	33.2	32.2	32.7	31.3	35.5	33.0	32.2	32.0
Green River "	"	11:00P	64	32.5	31.8	32.0	37.5	33.0	32.1	31.8	31.5	36.0	33.8	32.2	32.3
Laramie "	8/22	10:15A	64	32.7	31.8	32.0	35.3	33.2	32.1	32.1	31.6	35.3	34.0	32.3	32.3
Cheyenne "	"	4:00P	82	32.5	31.8	32.2	36.3	33.3	32.1	32.3	31.6	35.0	34.1	32.3	32.0
North Platte, Neb.	8/23	12:30A	52	32.3	31.8	31.9	36.3	33.5	32.0	32.4	31.4	36.5	34.8	32.3	32.0
Grand Island, "	"	9:00A	72	32.7	32.0	32.2	35.0	33.3	32.1	32.7	31.8	35.5	34.9	32.3	32.2
Council Bluffs, Iowa	"	3:40P	91	32.5	31.8	32.2	37.8	33.5	32.2	32.8	31.8	35.5	35.3	32.3	32.2
" " "	"	8:00P	82	32.4	31.8	32.2	39.2	33.4	32.1	32.4	31.6	35.9	35.7	32.3	32.2
Boone "	8/24	3:15A	56	32.7	31.6	32.5	37.8	33.5	32.0	32.7	31.6	35.3	35.7	32.3	32.2
Clinton "	"	10:30A	77	32.5	31.8	32.8	37.3	33.5	32.1	32.3	31.8	35.3	35.7	32.5	32.3
Proviso, Illinois	"	7:00P	77	32.5	31.7	33.3	40.0	33.2	32.1	32.3	31.6	36.7	36.2	32.0	32.2
Blue Island "	8/25	2:15A	64	32.5	31.7	34.2	39.0	33.5	32.0	32.8	31.6	37.2	36.5	32.2	32.2
Dolton, "	"	7:30A	72	32.9	32.1	34.5	38.5	33.5	32.3	32.7	32.0	37.6	36.7	32.5	32.8
Logansport, Ind.	"	11:45A	82	32.5	32.0	35.0	40.5	33.5	32.2	32.5	31.8	37.3	36.7	32.5	33.0
Columbus, Ohio	"	6:45P	76	32.7	32.1	35.8	42.0	33.2	32.2	32.5	32.0	37.8	36.8	32.3	33.0
Pitcairn, Pa.	8/26	4:00A	60	32.5	32.5	36.1	40.5	33.3	32.3	32.6	32.6	38.2	37.5	32.2	33.0
Altoona "	"	9:10A	68	32.6	32.6	36.1	39.2	33.3	32.5	33.0	32.5	38.2	37.0	32.5	33.0
Enola "	"	1:45P	84	33.2	32.8	36.4	41.1	33.5	32.5	32.9	33.1	38.0	37.4	32.6	33.6
Harismus Cove, N. J.	8/27	2:30A	68	32.8	33.5	37.3	43.1	33.3	32.7	32.7	33.3	37.7	38.2	32.3	34.3
New York	"	7:00P	76	32.8	35.0	37.5	32.9	33.3	33.3	32.8	34.5	37.5	38.2	32.5	35.0

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Fruit and Vegetable Transportation Investigations

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